THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—48TH YEAR SYDNEY, SATURDAY, DECEMBER 23, 1961 No. 26

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MEDICINE AND TELEVISION.

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IT is important in medicine that we should always be ready to take advantage of the latest technical developments and to exploit them to the full for our own peculiar purposes. Television, as one of the most significant of these, has undoubtedly reached the stage where its future in the development and teaching of medicine merits close examination. I propose to discuss the subject under the following headings: (i) as an aid to teaching and to facilitate demonstration; (ii) in monitoring treatment; (iii) as an aid to diagnosis.

AS AN AID TO TEACHING AND TO FACILITATE DEMONSTRATION.

Closed-Circuit Television.

For a localized audience—as, for example, within a hospital—the picture is picked up by camera and supplied (via cables) direct to any number of monitors.

The distance which can be covered by cameras is limited to a radius of, say, 1000 feet, whereas the display by monitors can be extended to a distance of several thousand feet. If transmission is required to a more distant audience, a link system containing amplifiers should be added.

Telecast.

For a decentralized audience—as, for example, to practitioners scattered in different parts of the city—the picture is transmitted as an ordinary telecast. Such a transmission can be picked up by every receiver within the service area of the transmitter which is tuned to the appropriate channel.

Of the various television camera chains available, only the following two are in frequent use in medicine: (i) a camera-chain with an "Image Orthicon" pick-up tube similar to that used in the standard studio camera; (ii) a camera-chain with a "Vidicon" pick-up tube of the type which is mainly used in television cameras designed for industrial use.

Increasingly visual aids are being used in education, and in accordance with this pattern it seems certain that television will come to play an increasing role in teaching in our medical schools. A direct telecast of a clinical demonstration or of an operative procedure leaves all the more vivid impression on the viewer by the realization that he is being admitted as an observer of the live event.

Television can help to solve two problems in undergraduate teaching. (i) If the demonstration field is so small that only one student can see at a time, tele-

vision makes it possible for several to view and to observe clearly a phenomenon—as, for example, a physiological experiment—with all the advantages of a front-row position. (ii) If several small student groups are placed in different locations—as, for example, in various teaching hospitals—it will be possible to link them all together so that clinical demonstrations of rare or of unusual happenings can be shown to all the students in a medical school simultaneously. Television, in fact, makes it possible to transmit the knowledge of a wide spectrum of educational material to a decentralized audience.

Television is also of immense potential in post-graduate teaching. Post-graduate committees in Australia have to contend with rather more difficult circumstances than those prevailing in more closely settled communities. However, in any community it is exceedingly difficult to organize a lecture or a meeting at a time and place which makes it easy to attract a maximum audience. Despite the fact that the post-graduate student may feel the need for personal contact with the lecturer, the calls of a busy practice deter him from attending medical meetings. With the increasing difficulty of keeping abreast of new developments in medicine, frequent contact with specialists in various fields is of particular value to the working graduates. We can use television to help us to overcome this fundamental difficulty.

It should be possible by the use of television to exploit almost any type of teaching technique and to deliver the message to the student in his own home at a time which experience suggests is most likely to be convenient to him. It should even be possible, by the use of a telephone, for the listener to dial a certain number and to speak to the lecturer. Thus his question could be dealt with on the spot and personal contact could be established, the subject being kept refreshing and alive. Closed-circuit television has in such circumstances little to offer; it is no easier to assemble an audience in several places, in reasonably close proximity to each other, than to bring them together in a single auditorium.

A telecast over one of the standard channels is the only possible means of reaching an audience that is widely scattered. However, viewing under such circumstances is open to all, and to save embarrassment and to satisfy ethical considerations, it would be necessary so to water down the material as to make it unsatisfying for the specialist medical viewer.

The alternative is the exploitation of a coding technique. By the use of this technique, the lines of the programme before transmission are scrambled by a special coding device. The picture as picked up by any ordinary viewer tuned to this channel is a meaningless blur. Members of the medical profession could, however, be supplied with a decoding device designed to unscramble the message and to restore a proper picture. Although the idea may seem a trifle ambitious at this stage, the feasibility of such a restricted broadcast is deserving of close examination (Zworykin, 1957).

During the Victorian Cancer Congress in Melbourne in 1960, we carried out an experimental transmission with the help of the Australian Broadcasting Commission. A short programme designed to demonstrate the potential of television in post-graduate medical education was relayed directly to the Congress, and this with some success.

An investigation in 1959 carried out by the Council on Medical Television revealed that 20 medical schools in the United States had some kind of television facility. Nineteen were using the equipment in medical education, and 15 were providing regular programmes for the education of post-graduate as well as undergraduate students; 12 other schools had, in that same year, planned to install television facilities. In addition, several medical schools were using the local commercial television stations for broadcasts to practitioners. In other words, with the help of this type of telecast, medical education could be better served by enabling the teaching authorities to reach a larger audience (*a*) by creating lecture conditions of the utmost convenience, and (*b*) by stimulating wider interest in the subject. If such a telecast was carefully organized and presented in an interesting form supplemented by every teaching device capable of adaptation to this medium, there would be every likelihood of attracting and holding the interest of even the most casual viewer.

Dental Teaching.

Dental surgeons have made use of television techniques in presenting intraoral manipulations to a student audience. The visual image is conducted along a flexible fibre bundle and is connected to a television ("Vidicon") camera. The small diameter of the fibre bundle allows its convenient positioning within the mouth without restricting the free manipulations of the surgeon. It is possible, by the use of this technique, to show to an audience of many, steps in the excavation and filling of a dental cavity which are normally difficult enough to display to an audience of one (Hovanian and Haswell, 1959).

The Televising of Operations.

Studio ("Orthicon") cameras have been extensively used in the televising of surgical operations. Recent experience in viewing colour television displays of operative procedures has made surgeons keenly aware of the shortcomings of the ordinary black-and-white image. However, these criticisms, although damaging and with good reason, should not blind us to the merits of a black-and-white image, in comparison with the restricted view that is all that a spectator can expect from the floor of the operating theatre. It is certainly a common enough experience, when trying to follow the technique of a distinguished surgeon, to enjoy only short-lived glimpses of the operation field and the frequent frustration of hands and heads which are very much in the way.

Colour television is still in its relative infancy; it is certain to develop materially in the future. If we are to receive a picture which coincides, in its colours, with the original before transmission, it is necessary to split it into the three basic colours. By additive mixing of the three basic colours (red, yellow and blue), nearly all the colour shades can be reproduced. The basis of this type of mixing is in accord with the trichromatic theory of vision. At present the preparation and the operation of equipment need a big staff. The capital investment and maintenance make a large budget necessary. Moreover, the illumination for this colour work has to be increased tremendously. Colour television needs six times as much illumination as does black and white. For colour telecast of an operation, special equipment has to be installed. We believe that the further development and miniaturization of the colour camera will make it possible to institute a closed-circuit colour television as a standard method of viewing surgical operations in hospital.

In Monitoring Treatment.

Thoracic Surgery.

Under modern conditions, the surgeon in many fields (and this is particularly the case in the specialties) calls on a variety of electronic devices, such as the electroencephalograph, the electrocardiograph and the electromanometer. These must be employed in the operating theatre and, being space-occupying, they tend to impede free movement and to compromise in some degree the practice of the aseptic ritual. There is sometimes, in addition, an explosion risk. However, most of this equipment can conveniently be mounted in an adjoining room, the data from the monitoring dials being transmitted by television camera to a single screen immediately available to the surgeon.

Radiotherapy.

Television surveillance is now established in the supervision of patients who are being treated with high-voltage

radiotherapeutic equipment. With the incorporation of an intercommunication system, it is possible not only to see the patient, but to boost his morale by words of encouragement.

The continuous watching of patients in mental hospitals can similarly be achieved by closed-circuit television.

As an Aid to Diagnosis.

Endoscopy.

Endoscopy has very considerable shortcomings, chief of which is the restriction imposed by the use of a small monocular eyepiece. The discovery of television was, therefore, of very great interest to those concerned in the improvement of endoscopic techniques, for it offers the following potential advantages over the standard viewing methods: (*a*) The image can be viewed immediately. (*b*) It can be seen by many people and, if need be, in different places, so that teaching and consultation are facilitated. (*c*) The image can be enlarged many times. (*d*) The viewing of the image is binocular. (*e*) The image can be corrected by appropriate adjustment for brightness and contrast. (*f*) The image can be recorded from the television screen, by means of either a still or a synchronized ciné-camera, and these records can be made selective.

The first televised bronchoscopy was reported by Soulas *et alii* in 1956. A standard studio ("Orthicon") camera was used. However, this camera weighs some 160 lb., and its bulk makes easy manipulation impossible. Even the industrial ("Vidicon") cameras were still too heavy (4 to 8 lb.) and unwieldy, and it was necessary, in order to facilitate accurate handling, to incorporate a counterbalancing system. One of the fundamentals of any endoscopic technique is that the operator shall have complete control over the passage and manipulation of the instrument. He is largely dependent on sensations of resistance conveyed to his hands during such manipulations for the avoidance of dangerous pressures, with the risk of damage to mucous surface or even of perforation of a viscus. There was, therefore, a strong argument in favour of the development of a camera which could be coupled directly to the endoscope, and which was small enough to be moved without the need for any balancing or supporting system.

With this in mind, we set about developing a television camera which would have the following specifications: (i) It should be as small as possible, and it should be simple enough in design and rugged enough in construction to be operated by people untrained in television techniques. (ii) Its use should not be time-consuming, and should be without risk to the patient. (iii) It should be as cheap as possible, both in its production and in its running cost, in view of the fact that it would eventually have to be operated within the restriction of a hospital budget. (iv) It should work on the same lines as the local television network (in Australia 625), so that it could be used in conjunction with the standard commercial receivers.

Moreover, before television could win a place as a valuable aid in endoscopic technique, it was necessary to give a satisfactory answer to three fundamental questions: (i) Can television technique be adapted to our standard methods of endoscopy? (ii) Is the television image comparable in quality with the normal visual image? (iii) On the assumption that the advantages of television may be considerable, are they real enough to offset the loss of colour and the other limitations of a black-and-white image?

We have investigated each of these three questions, and the results of our inquiries will be published elsewhere. Suffice it to say that the answer to each of the questions would appear to be in the affirmative. To date we have had experience only with bronchoscopy, œsophagoscopy and indirect laryngoscopy.

During the recent Victorian Cancer Congress (1960), the endoscopic view of a patient with carcinoma of the lung and larynx was telerecorded in the Alfred Hospital, and this telerecorded image was then transmitted by the Australian Broadcasting Commission to the University of Melbourne, where it was displayed on monitors in the lecture theatre. The whole audience was thus able to follow the bronchoscopy and to recognize the pathological changes in the trachea and bronchi. They were also able to follow the movements of the vocal cords, which were displayed on a battery of 21-inch screens to demonstrate the paralysis which occurs as a sequel to damage to the recurrent laryngeal nerve.

Already we have found our television equipment to be an aid in diagnosis, but the field is as yet largely unexplored. At the moment we are improving the miniature camera so that it can be connected to a central camera control unit, and so that several miniature cameras, as well as a normal industrial camera, can be operated together and used in turn at the press of a button. We are hopeful in this way of being able to make simultaneous use of an image intensifier coupled with an industrial television camera. It will then be possible to see the X-ray image of the endoscope in position on the television screen, and to correlate, for example, in œsophagoscopy, the endoscopic picture and the position of the instrument in relation to the diaphragm and the vertebræ. The measurements of our miniature television camera are as follows: length, 120 mm.; diameter, 45 mm.; weight, 350 grammes.

X-Ray Television.

One of the great drawbacks of radiology is the hazard and inconvenience occasioned by the need to view the fluoroscopic image in the dark. Strenuous efforts have been made and are being made to make good this shortcoming.

The fluoroscopic investigation is limited by the physiology of the human eye, for as soon as the brightness or illumination decreases below certain levels the visual perception passes from cone to rod vision; this involves a great loss of subjective sharpness, and with loss of sharpness the appreciation of the detail is remarkably diminished. This is the reason why we cannot see on the fluoroscopic screen, even when fully dark-adapted, those details which we are later able to recognize on an X-ray film. With reduced illumination there is also a decrease in colour discrimination. Among the colours, the green colour remains the most recognizable under poor illumination. The visual acuity and the contrast sensitivity of the eye are very low at the brightness level of a fluoroscopic screen. On the average, a screen converts only 5% or less of the X-ray beams into a visual image (Williams, 1956; Garthwaite and Haley, 1959).

Progress was made by the introduction of the image intensifier, which was based on the image converter (Holst *et alii*, 1934). The image intensifier is an evacuated glass tube in which, at one end, a photocathode lies in contact with a fluoroscopic screen. When X-ray beams pass the screen, this fluoresces, and the fluoroscent light sets electrons free from the photocathode and these become accelerated. By means of an electric field ("electronic lens"), the image is reproduced on the other end of the tube (anode) in a reduced size. The reproduced or displayed image on the anode is in diameter approximately one-tenth of the fluoroscopic image size. The image from the anode is collected with a lens system and can be viewed with the eye. The image intensifier is available in different sizes (five, seven and nine inch). The reduction in the amount of X-ray energy required is considerable (Teves and Tol, 1952).

Advantages of this method are as follows: (i) There is a considerable reduction of the radiation. It is, however, important to bear in mind that the image intensifier cannot be used with impunity (Cramer, 1959). (ii) The image is immediately available without loss of valuable time. (iii) The image can be viewed immediately, only partial dark adaptation being required. (iv) The image intensifier is mobile. There are, however, certain disadvantages. (i) The degree of resolution is limited. (ii) Monocular viewing of a smaller and reduced image is difficult. (iii) The picture quality can be altered only with the alteration of the X-ray energy.

However, the introduction of the image intensifier undoubtedly represents a great step forward in radiology, and this equipment is capable of wide application (Janker, 1958; Morgan, 1958; Stevenson and Ferguson, 1961).

Fluoroscopic Screen Intensifier.

Morgan and Sturm reported in 1951 that they were successful in using a 12 in. screen with a mirror optic in position. In the focus of this optic an "Image-Orthicon" television camera was mounted.

Other constructions called "Image Amplifier", using a 4·5 in. "Image Orthicon" with the mirror optic and 12 in. screen, have been developed (Garthwaite and Haley, 1959).

The Light Intensifier.

This consists of a 12·5 in. X-ray screen and a large mirror system. The mirror optic focuses the image on a so-called "light intensifier" (which functions in a similar manner to an image intensifier), and the image is displayed on the anode of this "light intensifier". From here a fast lens collects the image and projects it into an eye-piece or film or television camera (Janker, 1960).

It soon became evident that to the advantages of an improved brighter screen image offered by the image, light or screen intensifier, or image amplifier could be further added the use of television.

The further advantages of a televised X-ray image compared with the ordinary visual image of the image intensifier are as follows: (i) Dark adaptation is not necessary at all. (ii) Since the investigation can be carried out at a certain fixed distance from the patient, further reduction in the X-ray dosage for the surgeon or assistants can be achieved. (iii) The contrast or brightness of the screen can be increased without altering the X-ray energy; in fact, the brightness is greater than that of the fluoroscopic screen. (iv) The image can be viewed as a positive or as a negative picture. (v) The picture can be seen by many people.

In July, 1958, we demonstrated our first successful experiment with a televised and telerecorded X-ray picture of the movement of the fingers, and since then we have used this technique for heart catheterization and barium examination.

Television Image Storage.

One of the great drawbacks of radiology is the hazard and inconvenience occasioned by the need to view the fluoroscopic image in the dark. Strenuous efforts have been made and are being made to make good this shortcoming. It is apparent that any method which makes it possible to store the X-ray image for a longer period than the actual screen or exposure time would allow of a substantial reduction in the amount of radiation. Several methods have been used to store the television image. Many of them are in the experimental stage, but I should like to mention in particular the following.

Methods of Permanent Recording.

Ciné-Recording.—Here the televised image is recorded from a special screen with the help of a synchronized movie camera. It is possible in this way to take a permanent record of movements over any length of time. The film can be stored for as long as is necessary and displayed or viewed at any time, either as a single frame at a time or as a movie sequence. However, this method of storing the image has the great disadvantage that the record is not immediately available. Moreover, storage occupies much space.

"Video" Tape.—This method allows of the immediate and repeated display of the image, and the tape can be wiped and rerecorded. The equipment is exceedingly expensive, and it is not possible to view a single still image (Jutras, 1959).

Methods of Instantaneous and Temporary Storage.

After-Glowing Screens.—This type of screen holds the picture for a certain time; but it is necessary to wait until the first picture has faded before a second can be scrutinized.

Memory Tube.—This is similar to a monitor screen and holds the picture for a certain time. The picture can be demonstrated on only one screen—namely, on the memory tube itself. This picture can to a certain extent be wiped (Wallman and Wickbom, 1959).

Magnetic Wheel.—A rotating drum with an endless magnetic tape is used. The drum rotates continuously, and it is so designed that, at a certain speed, the diameter of the drum records the image of one complete television field. After recording, automatic display is possible and the image can be stored indefinitely. It is also possible to wipe the image and to use the drum again. Several television pictures can be stored beside each other on one tape. Some tapes, for example, will accommodate up to 12 television pictures (Wessells, 1960; Schut and Oosterkamp, 1960).

Electronic Charge Storage.

This involves storage of the electronic signal in a special charge-storage tube. The image intensifier is coupled with a television camera. The signal from the camera is in turn sent to the storage tube, from which a signal is obtained for display of the picture on the monitor screen.

The advantages of this system are as follows: (i) It is possible immediately to display the picture on the monitors. (ii) There is storage of complete contrast, which diminishes only slightly after ten minutes of continuous display. It may be possible to extend the storage time by interruption of the display. (iii) It is possible to store several pictures at the same time. (iv) By the incorporation of a cycling circuit, the picture can be stored and wiped and replaced automatically. The wiping period, the X-ray exposure and the write-in procedure are all automatic and timed to follow each other instantaneously. A slow movement—as, for example, the introduction of a cardiac catheter or the insertion of a Smith-Petersen pin or a Küntscher nail—can be followed with the application of this stroboscopic viewing. At present, the shortest time interval within which the image can be changed is one second. The system allows substantial reduction of X-ray dosage, since a single X-ray exposure can be watched on the screen for up to ten minutes, and its permanent recording can be achieved from the screen.

The disadvantages of this equipment are as follows. Since only the stroboscopic effect is available, this method is not available for the display of fast movements—as, for example, those we encounter in angiocardiography. Moreover, the tube has a guaranteed life of only 600 hours. However, while admitting these disadvantages, we have found that X-ray image storage affords us at the present stage of development of this work the best conditions and for the following reasons.

1. There is a substantial reduction in radiation hazards. It has been recognized since the introduction of the image intensifier that a certain radiation hazard still exists when the image intensifier technique is used. We have used in our laboratory a waxed dummy encasing a fractured femur, the bony ends being held together by wires 1 mm. thick. The radioabsorption of the dummy was approximately equivalent to that of a medium-sized human thigh. With the mobile X-ray units presently in use in our hospital, we need a 45 mAsec. exposure for an X-ray picture of a femur in man. We were able to produce and to store a reasonable picture from this dummy with 0·75 mAsec. by the use of the same conditions. This means approximately one-sixtieth of the normal radiation current. Our work with this equipment is still in the experimental stage, but we have every hope of being able to improve the efficiency of the unit still further, and it is then our intention to give it an extended clinical trial.

2. The image is immediately visible. This will be obviously of immense value to the surgeon, radiologist and patient alike. If we consider how much time can be

Australian Medical Congress.

FIRST SESSION, ADELAIDE, MAY, 1962.

THE following information has been supplied by the Executive Committee of the First Session of the Australian Medical Congress, which is to be held in Adelaide from May 19 to 25, 1962.

The Inaugural Meeting of the Australian Medical Congress will immediately precede the Congress meeting on the evening of Saturday, May 19, 1962

Provisional Programme.

The provisional programme of Congress is as follows:

Saturday, May 19: Registration. Sporting and social arrangements.

Sunday, May 20: Church services. Christian Medical Fellowship meeting. Private entertainment.

Monday, May 21: Registration. Opening of Pharmaceutical and Scientific Instruments Exhibition. Scientific Exhibition. Hobbies Exhibition. Private entertainment. Inaugural Ceremony. Opening of Congress. Presidential Reception.

Tuesday, May 22: Scientific sessions. President's dinner and private entertainment.

Wednesday, May 23: Scientific sessions. Golf competition. Congress dinner.

Thursday, May 24: Scientific sessions. Garden party at Government House. Henry Simpson Newland Oration.

Friday, May 25: Scientific session. Congress ball.

Saturday, May 26: Excursions. Sporting fixtures.

Plenary and General Sessions.

Details of Plenary and General Sessions are as follows:

Tuesday, May 22: Plenary Session I: "Social and Psychological Aspects of Medicine—(i) Social Aspects of Disease; (ii) Psychological Aspects of Disease; (iii) Psychosomatic Disease." General Sessions: (i) "Problems of Marriage"; (ii) "Medical Problems of the Migrant"; (iii) "Problems of Addiction".

Wednesday, May 23: Plenary Session IIA: (i) "Accident Prevention in the Home"; (ii) "Accident Prevention at Work"; (iii) "Iatrogenic Disease". Plenary Session IIB: (i) "Dangers to Man in the Environment Used by Fliers—Present and Future"; (ii) "Selection of Aeronauts"; (iii) "Problems Met in High Speed Flight".

Thursday, May 24: Plenary Session III: "Hereditary in Human Disease—(i) Genetic Transmission of Disease; (ii) Genetic Counselling; (iii) Migration and its Effect on our Genetic Pool". General Sessions (concurrent): (*a*) (i) "Chromosomal Aberrations and Disease"; (ii) "Metabolic Disorders". (*b*) (i) "Hereditary Aspects of Malignant Disease"; (ii) "Hereditary Aspects of Degenerative Disease".

Friday, May 25: Plenary Session IV: "The Neonatal Period—(i) Physiology and Behaviour in Normal Newborn; (ii) Recognition and Management of Abnormality; (iii) Sequelæ of Neonatal Disease". Panel Discussion (in place of General Sessions): "Common Problems in Newborn."

General Notes.

The following are matters of general interest:

Film Festival.—The Film Festival promises to be an outstanding programme of medical films, few of which have been shown in Australia. There will be 50 films with a total screening time of 1300 minutes.

Combined Meetings.—The policy of the Scientific Committee to arrange combined meetings of Sections, whenever possible, is bearing fruit. Members attending Congress will find that as a result of these combinations they will be able to cover a much wider variety of topics than has been possible in the past.

Plenary and General Sessions.—Plenary and general sessions also cover a wide range, including one session which probes extra-terrestrial realms. A participant in this session will be Lieutenant-Colonel Charles A. Berry, Chief of the Department of Flight Medicine U.S.A.F.

Expeditions in South Australia.—Travel possibilities by members are being explored actively but will be limited at this Congress to expeditions in South Australia. The opportunity to see the Flinders Ranges and to visit "the Alice" are practical propositions. Early registration will help the organizers make available facilities which cannot be mobilized on the spur of the moment.

Museum and Scientific Exhibition.—Contributions are invited for the Museum and Scientific Exhibition. Numbers of offers have already been received from members who will shortly be again communicated with.

Hobbies Exhibition.—Offers of exhibits are invited for the Hobbies Section. The acceptable range is wide and offers or inquiries may be directed to the Chairman.

Photographic Exhibition.—Entries are invited for the Photographic Exhibition, which will cover subjects of general interest or paramedical interest in the following sections: (i) 35 mm. colour slide exhibition with small trophies and with provision for projection sessions; (ii) print exhibition (black and white or colour) with small trophies. There will be no section for ciné films, but a special contribution, either 8 mm. or 16 mm., would be considered: if it was suitable, projection times would be arranged. There may also be an exhibition of a high quality loan collection of 35 mm. colour slides. Further details will be announced later.

Anthropological Film.—Provided that the over-all programme permits, a unique Australian anthropological film will be shown.

Registration.

The Executive Committee stresses the importance of urgent application for registration. This is because of the difficulty in holding block hotel bookings after January 31, 1962. Application forms for registration are available from local State secretaries, a list of whom was published in the issue of November 25, 1961, at page 888, or from the Honorary Secretary of Congress (use the tear-off slip below). The subscription is £8 8s. plus exchange.

AUSTRALIAN MEDICAL CONGRESS, ADELAIDE, SOUTH AUSTRALIA.

MAY 19 to 25, 1962.

Honorary Secretary,
Australian Medical Congress,
80 Brougham Place,
North Adelaide, S.A.

Please forward me an application form.

NAME .....

ADDRESS .....

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spent in waiting for the development of X-ray exposures in the operating theatre, the value of any manœuvre which will eliminate the interval of waiting is immediately apparent. Theatre times in most hospitals are at a premium, and the economics of the efficiency of theatre usage is of some real consequence.

3. The image can be viewed simultaneously by many people in different places. The potential of the equipment in relation to teaching is considerable. The image can be shown at the same time in the operating theatre and in the office of the radiologist and consultant.

4. The image, as recorded from different angles, can be made available immediately by mounting two cameras and two image intensifiers; the television image from them all can be stored on the screen one after the other by simple press-button control. The antero-posterior and lateral views can be demonstrated one after the other at will. With modifications of the equipment, it may be possible to show both simultaneously.

5. The screen image can be photographed with either a 35 mm. still camera or a 16 mm. movie camera. These film records can be placed in the patient's history.

6. It is possible to make stroboscopic recording of slow movements by preselected repeated exposure times at a determined interval. At the same moment we can preselect a repetition of the picture at any interval between one and five seconds. This means that if, for example, we choose three-second intervals, the X-ray film is exposed during the first one-sixth of a second and the picture is stored for the rest of the three seconds. It is then wiped off automatically, and the next picture appears on the screen. In this way, insertion of nails, such as Smith-Petersen and Küntscher, and the manipulations of complicated closed fractures can be followed directly. Slow movements, such as those involved in the introduction of cardiac catheters, can similarly be observed with much less radiation than is required when the normal routine methods are employed.

Microscopy.

We have not collected experience in this subject, but it is known that the microscope can also be coupled with a television camera. There are several ways of achieving this—for example, in black and white within the visual range. The image is observed on a standard television receiver, say, 21 inch. The brightness of the image can be materially increased above the level allowable when the standard visual method is used. It is possible in this way to observe more detail.

There are special "Vidicon" tubes available which are sensitive to ultra-violet light. By the use of such a tube, it is possible to make a continuous observation of specimens—as, for example, a living cell—under ultra-violet illumination. Some components of the living cells which are ordinarily not distinguishable show characteristic absorption in ultra-violet light.

Colour television has been used also in conjunction with microscopy (Parpart, 1951; Zworykin and Chapman, 1956; Zworykin, 1957).

Infra-Red Television.

Infra-red photography is an established method in the medical field. The infra-red wave-length is longer than the normal visual wave-length and is for this reason invisible. The rays penetrate to the deeper layers of the skin; this has been used, for example, to demonstrate superficial veins. The reflections of the infra-red rays are proportional to the density of the material. We have made some trials with the special "Vidicon" tube with wave-lengths up to 2·2μ. The picture can be obtained by exposing the object to infra-red rays; alternatively, if the temperature difference between the object and its environment is significant, the object becomes visible. Certain phenomena—as, for example, where observations in light could disturb physiological happenings—can be observed in darkness. The existing pick-up tube is not sufficiently sensitive to register the temperature difference within the physiological ranges that prevail in the human body; but if infra-red irradiation can be projected, for example, into a body cavity, it will be possible to produce a satisfactory and useful picture.

Conclusions.

Television offers a great deal in many different branches of medicine as an aid to teaching and demonstration and also in diagnosis. It has now passed through the early stage of experiment, and it is appropriate that the universities and other organizations interested in undergraduate and post-graduate teaching should investigate and exploit the application of new techniques. It has been the purpose of this paper to indicate something of the range of usefulness of television techniques, and also to point out that we have not as yet exploited this potential to the full.

Closed-circuit television can be exceedingly valuable as a method of introducing an audience in hospital to a spectacle, particularly in the operating theatre, which can normally be presented only to a very restricted audience. An extension of the closed-circuit system to link major teaching hospitals might be exceedingly useful. It may be that post-graduate education committees may be able, by the use of coded telecast programmes, to establish effective contact with the general practitioner and specialist in his own home.

Colour television is at present not a feasible proposition. The low sensitivity of the cameras is of itself a considerable disadvantage from the surgical point of view, and the equipment and staff necessary to control the bulky equipment make it too expensive a proposition to be dealt with in our hospital budgets. The reproduction of the dominant colours is adequate, but the mixed colour reproduction will have to improve somewhat before we obtain a natural impression of the original colour values.

A miniature television camera has been constructed to satisfy the needs of routine endoscopy. The enlarged black-and-white image obtained in this way is immediately available, and can be used not only for demonstration, but also in diagnosis. The application of this technique to bronchoscopy, œsophagoscopy and indirect laryngoscopy has already been explored in clinical practice, and the results obtained justify consideration of this method as a routine procedure.

The potential of this technique in conjunction with other endoscopic equipment is very considerable. Moreover, there are several possible ways of combining endoscopy with alternative diagnostic procedures being carried out at the same time.

The usefulness of X-ray television in certain surgical and radiological procedures is already clearly established. The advantages of this technique are as follows: (i) it allows of a considerable reduction of radiation hazard; (ii) the picture is immediately available; (iii) there is no need to wait for a period of dark adaptation; (iv) the picture is enlarged; (v) there is binocular viewing of the displayed image; (vi) the image can be adjusted for brightness and contrast to suit the individual viewer; (vii) it is possible to make still and movie records of the image.

Immediate clinical applications of this technique are considerable: (*a*) in the manipulation and reduction of fractures of the extremities; (*b*) in the removal of radio-opaque foreign bodies; (*c*) in the operative reduction and fixation of complicated fractures, or in the insertion of a Smith-Petersen pin (Lindblom, 1960) or an intramedullary nail, in per-operative cholangiography (Mallet-Guy, 1958) and also in the exploration of the kidney when there are small or multiple stones in the calyces, in heart catheterization and for the localization of the Seldinger catheter before commencing angiocardiography.

X-ray television image storage will introduce a new epoch in radiological technique if the present experimental stage can be successfully passed and suitable equipment designed for use in routine clinical work. Equipment

using an electronic charge storage tube, which is presently under development, offers great promise in this direction.

Although the cost of installation of television equipment in a hospital involves a considerable capital outlay, we can set against this high capital cost a potential saving in time and also in the number of X-ray films which may be required.

Acknowledgements.

This work in television research has been carried out in the Department of Surgery at the University of Melbourne with the support of a special grant from the Anti-Cancer Council of the State of Victoria. The television work has been conducted by Mr. J. Davids, assisted by Mr. L. A. Kont and Mr. F. C. Caldwell. The storage unit was designed by Mr. A. H. Seyler, of the Postmaster-General's Research Laboratories.

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HOLIDAY HAZARDS.

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GENERAL PRACTICE means paying attention to a population's health as a whole, whether it be a total population, as in my practice, or a patient population, as in urban practices. It also involves a specialized knowledge of (*a*) patients of long standing (possibly a lifetime), and (*b*) the majority of conditions with which the patients present.

This majority is not at all what one would expect from experience in full-time hospital practice. Extensive survey work by Pickles, Mackenzie, Logan, Pinsent, Eimerl and many others in Britain, Swift and Hone in this country and Braun in Austria have shown this very clearly. Truly we can say, with Jungfer, that there have been some changes. Yet these conditions form the large bulk of our national health problem and are the back-ground of most serious diseases, of the small portion of officially known illness and of illness requiring hospital and institutional care. Their overriding social importance necessitated the formation of the College of General Practitioners. Through this organization it will be possible to elaborate gradually the scientific foundations of this field of effort (Shannon, 1959; Southwood, 1951).

By virtue of his work the general practitioner is virtually the only person able to measure the health and biodynamics of the populace. Freudenberg *et alii* (1957) have shown quite clearly that morbidity statistics are unsuitable for the assessment of general health. Moreover, general morbidity is not clarified by a study of chronic illnesses.

My area lends itself well to the investigation of morbidity problems (Figure I). I serve an isolated peninsula east of a line from Karuah to Mungo Brush, with the nearest colleague 22 miles away and the nearest major hospital 50 miles away. About 80% of the static local population of about 1000 pass through my surgery in every three years, and virtually every tourist entering the blind-end area must pass over a vehicular ferry, where he must buy a ticket and be recorded.

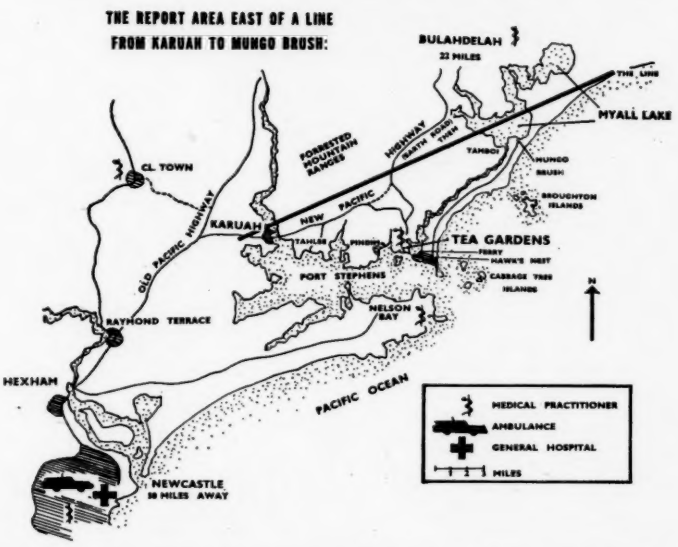

FIGURE I: Map showing the area which is the subject of the present report—that is, the land to the east of the line joining Karuah to Mungo Brush.

In this paper I have chosen to discuss holiday hazards, because by using the local population as a control, one can recognize the particular morbidity of the holiday-maker.

Holiday-making in the modern sense is necessitated by the monotony and disciplinary stresses of the machine age, by urbanization and by industrialization, as Schroeder (1960), Wurzbacher (1960) and many others have shown. Classical peasant communities produce few tourists. In this country we are involved in just such a process of urbanization and industrialization, and what can happen in this process to a small coastal village is shown in Figure II. As one can see, the annual number of tourists has risen since 1955 with increasing speed. In part this also represents a flight from morbid urban settings into scenic "second-home" retreats.

If this rise is plotted against the months of the year with January on the left, it is obvious that the periodic flow of people from the cities to coastal resorts is strictly seasonal; in other words, it follows the movement of the sun. All this, of course, is quite well known.

What is perhaps not yet known, is shown in Figure III. On the base line are the months, with January on the left. At the top of the graph are the concomitant recordings of temperature and humidity (rainfall is left out as being uncharacteristic). Below the average inflow of tourists is shown a black line, representing about 100,000 consecutive cars and trucks passing in the survey period (February 1, 1958 to May 6, 1960). As there were three each of February, March and April, and two each of every other month in the survey period, two-thirds of the values for the first-mentioned three months were used in all statistics to make them comparable. The corresponding number of tourist patients is represented by the dotted line, while the morbidity of the local population (980 census), shown by the stroked line, is taken for comparison.

As one can see, there is significantly more tourist illness in summer than in winter; and that this must be a specific tourist feature is borne out by the fact that the morbidity of the local population shows no such variation.

The question therefore posed itself immediately, as to why there should be a greater morbidity of tourists in summer than in winter. To ascertain this, the figures were divided at the critical points of change—namely, between May and June, and between November and December. Figure IV shows the proportion of illnesses in the tourists

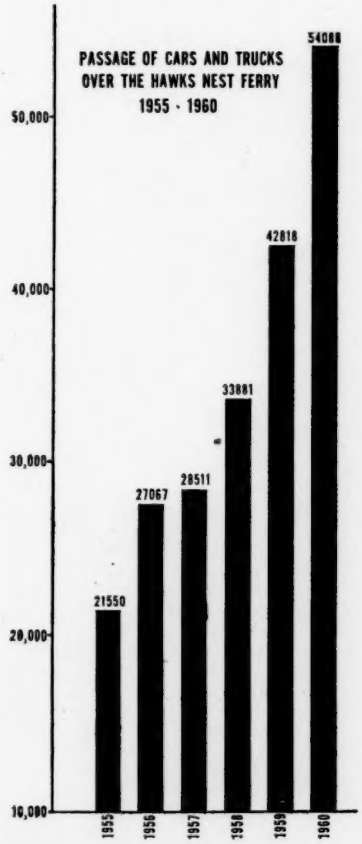

FIGURE II: Histogram showing the number of cars and trucks passing over the Hawks Nest Ferry in different years between 1955 and 1960.

on the left and the locals on the right, both groups divided into summer and winter categories and further split with regard to diagnoses and sites.

This diagram in the first place shows the profound impact of the seasons on our national health. While trauma, skin lesions, psychosomatic and cardio-vascular diseases prevail in summer, inflammations and infections, respiratory illness and affections of the genito-urinary tract prevail in winter.

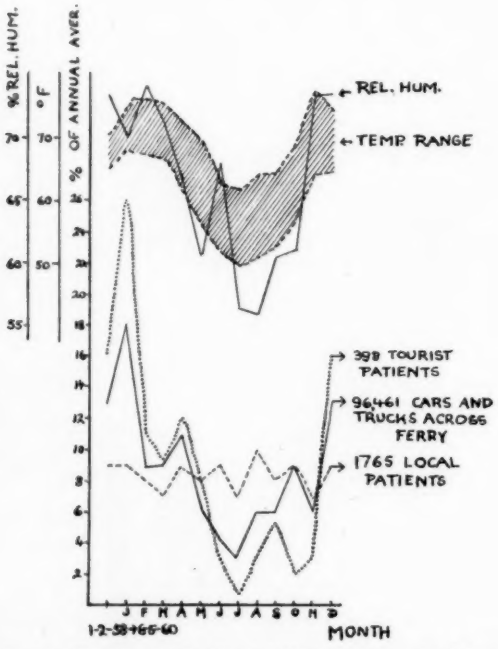

FIGURE III: Graph showing relationship of tourist influx, tourist morbidity and local morbidity to seasonal factors—namely, relative humidity and temperature.

It is interesting to speculate what part all these periodic adaptation stresses play in laying down the pattern of degeneration later in life, or whether cardio-vascular disease in summer, for example, is partly failure of a recently immigrated white population to adapt itself to a rather warm climate.

The diagram shows also that the tourists in their morbidity vary more between summer and winter than the local patients. Could this be due to age?

Figure V shows the age of locals and tourists. Most tourist patients are in the prime of their productive life. Age, by the way, is not the reason why the tourists show greater seasonal variation, because there is as much difference in the local patients below and above 50 years of age in their response to summer and winter.

However, the graph on the right shows that the two groups are also distinguished by sex, the tourists being predominantly male, while among the local patients females predominate slightly. Could that have a bearing on morbidity, as it has on mortality?

If we turn to our local controls again, we find inflammations and infections affecting 352 males and 365 females; asthma and allergy affected 35 males and 42 females; and degenerative complaints affected 86 males and 118 females. However, psychosomatic disease and trauma are striking in their preferences, psychosomatic disease affecting middle-aged females, while accidents are decidedly the fate of the young male (Figure VI). The base line again refers to age groups. If therefore sex has a bearing on the controls, and most tourists at risk are male, then trauma for them should be the dominant risk.

Figure VII proves this point beyond doubt and it shows one more—this trauma must be on the skin. Figure VIII makes it clear that while tourists in the prime of life

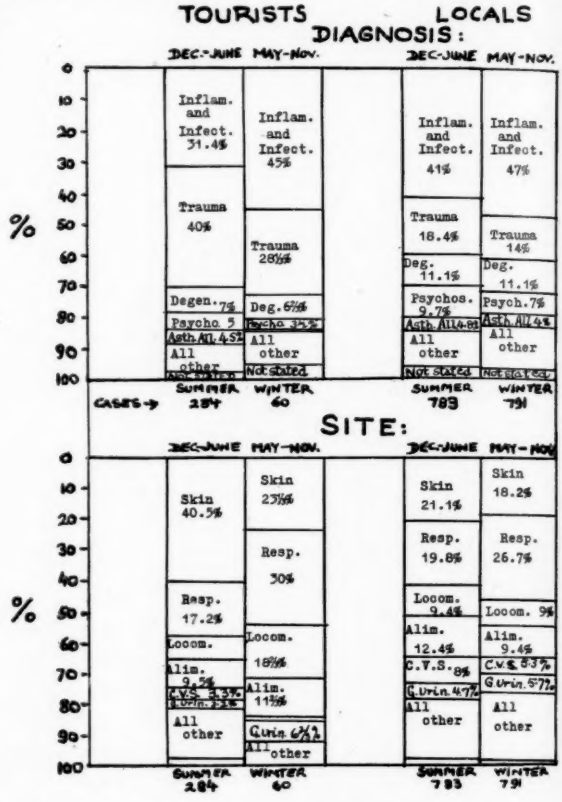

FIGURE IV: Diagram showing seasonal incidence of ailments among local and tourist population.

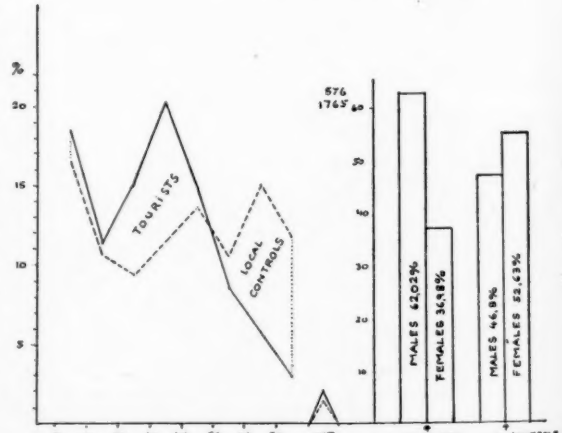

FIGURE V: Graph and histogram showing ages of tourist and local patients.

are generally at risk, the accident risk is highest for those in the second decade, those at high school and those in their teens; trauma rises to 60% of the total morbidity of the tourists in this age group. The local mor-

bidity is much lower, because most of the tourists are in the locality in summer (in the "traumatic" season), while the local percentage is flattened by winter morbidity.

The traumatic percentage of the older age groups can also be assumed to be lowered by the appearance of psychosomatic and cardio-vascular disorders, which are more frequent in summer.

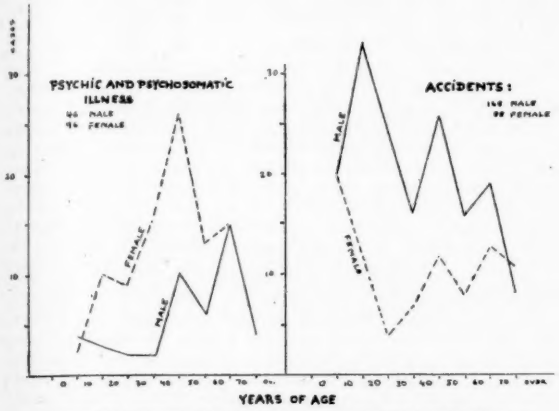

FIGURE VI: Graph showing relative age and sex incidences of psychosomatic illness and accidents occurring in a population of 980 (Census) between February 1, 1958, and May 6, 1960.

At this stage we can draw the following conclusions: (i) Tourist morbidity is mainly summer morbidity. (ii) In summer we see more trauma, cardio-vascular and psychosomatic disease and more skin lesions. (iii) In winter there are more inflammatory and infective, and more respiratory and urinary tract disorders. (iv) The tourist who is injured or diseased is most likely to be a male and in the prime of his productive life. (v) More females develop psychosomatic disorders, particularly in middle age. (vi) More males suffer accidents. (vii) The dominating tourist risk is trauma, mostly on the skin, and this traumatic risk is greatest in the second decade, declining afterwards.

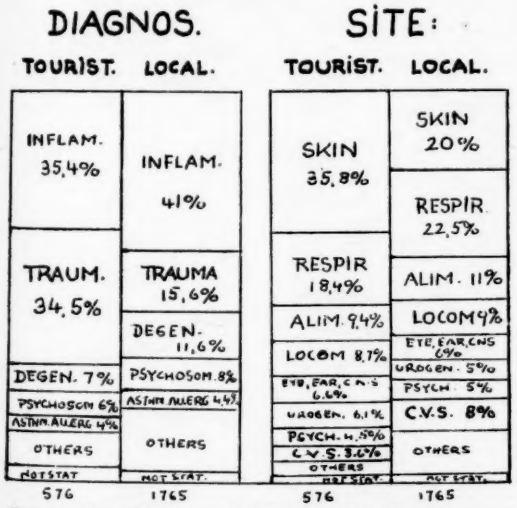

FIGURE VII: Diagram showing relative frequency of various types and sites of illness in local and tourist populations.

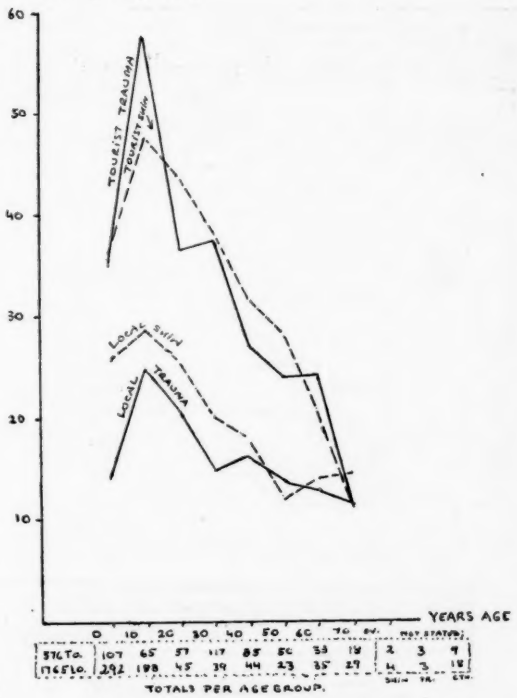

FIGURE VIII: Graph showing the incidence of trauma and skin lesions in each age group of tourist and local patients.

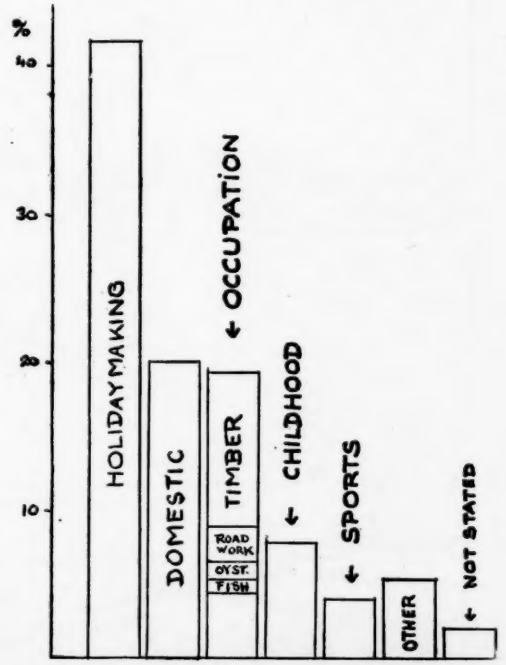

FIGURE IX: Diagram showing the accident pattern of a New South Wales coastal community from the point of view of the surrounding circumstances, judged from 435 consecutive accidents.

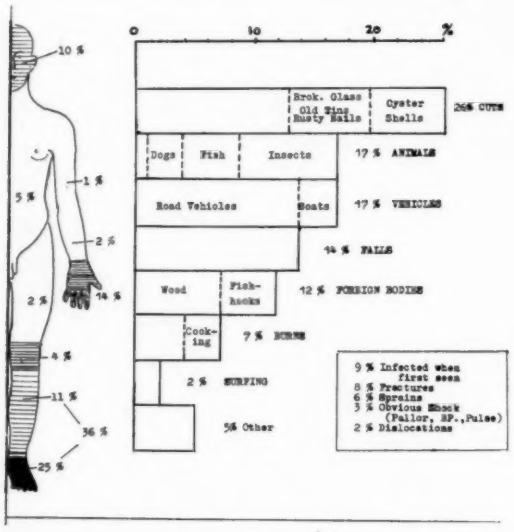

FIGURE X: Diagram showing relative frequencies of types, sites and causes of injuries sustained in holiday accidents.

Many of these skin traumas are of course near-misses of serious injuries. The accident problem in tourists in my community exceeds anything that local morbidity has to offer (Figure IX), in spite of the hazardous timber trade.

What constitutes this accident risk? Figure X shows the common site and cause of such tourist accidents. Truly, when one goes on a holiday one "puts one's foot in" as the saying goes, with the hand next and head high on the list.

From a perusal of the causes, one can see how morbidity research clearly indicates preventive measures of top priority. Anti-rubbish campaigns (public education regarding litter on beaches and camping areas), first-aid care of ordinary cuts (one in 10 injuries was infected when first treated), precautions against injuries from animals, care with road vehicles and boats, and removal of the causes of accidental falls are easily the most urgent. Foreign bodies, accounting for more than one in 10 accidents, are as a rule not so dangerous, but burns associated with cooking and fire-crackers can be fatal.

There is a significant risk in surfing, associated with sprains and fractures. Shark injury is extremely rare.

I could not resist the temptation to present the rather dry statistical survey in another form. Figure XI represents the frequency of accidents which occurred during the report period, either by size or by the number of persons depicted. This truly is the hazard of the Australian coastal holiday.

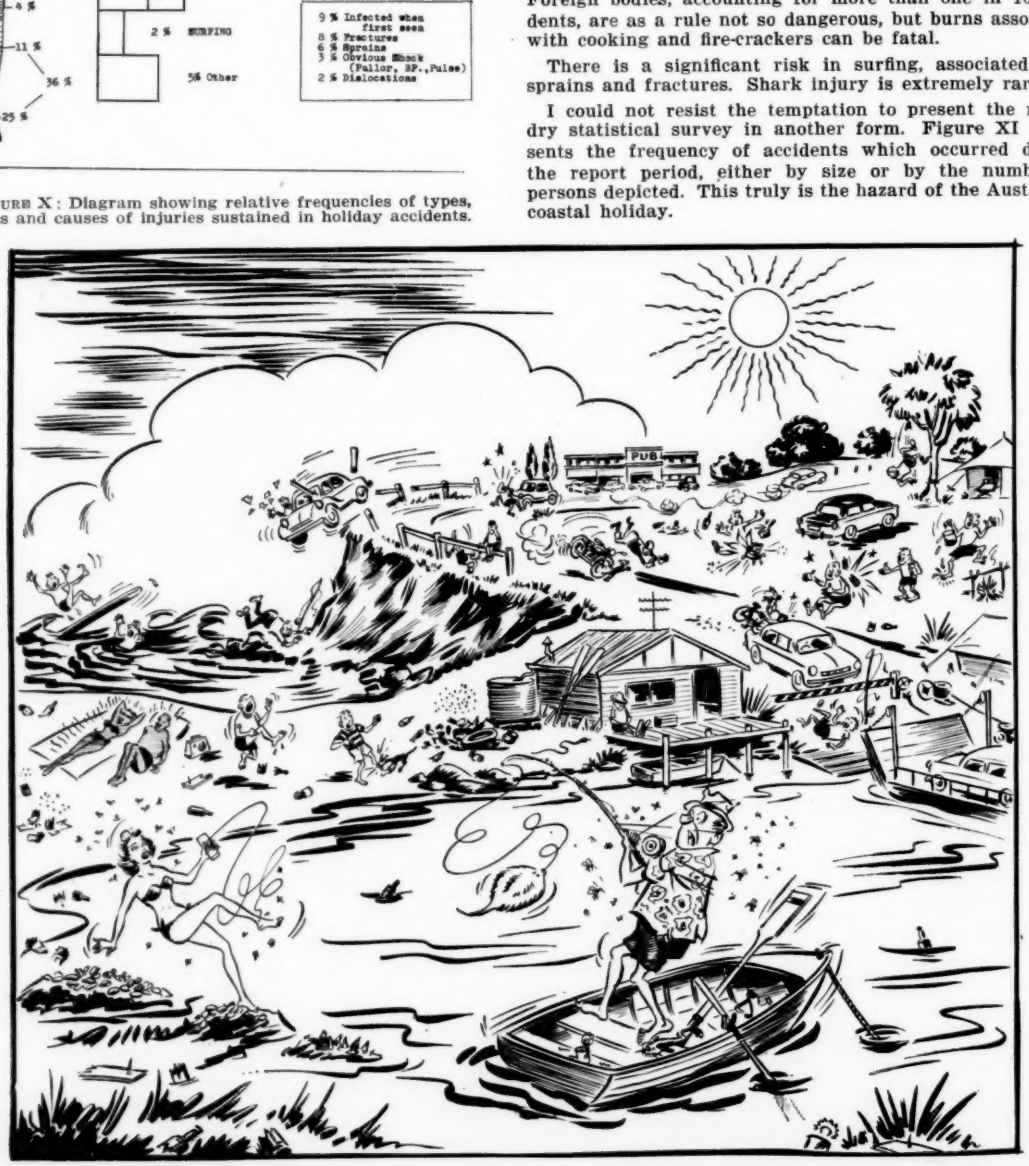

FIGURE XI: Holiday hazards.

Summary.

The morbidity in tourists associated with about 100,000 crossings of cars and trucks over a ferry into a dead-end tourist area was analysed in respect to season, age, sex, cause, anatomical site and so on, during 27 months, as a basis for prevention and education. The morbidity of the static local population of 980 (census) served as control. The largest tourist hazards were accidents and skin lesions, affecting mainly males in the prime of their productive life.

Acknowledgements.

I am greatly indebted to the following people: Dr. Alex Johnson, Honorary Secretary of the Committee in Preventive Medicine of the Council of the Australian College of General Practitioners and the Department of Health, Canberra, for having my records processed with the aid of computing machinery of the Department of Census and Statistics and his staff; Dr. J. G. Radford, Chairman of the Research Committee of the New South Wales Faculty of the Australian College of General Practitioners; Dr. N. A. Andersen, Honorary Secretary of this Committee, and Dr. A. Rumore, Secretary of the New South Wales Faculty of the Australian College of General Practitioners for arranging this assistance for me; Professor P. O. Bishop, Department of Physiology, University of Sydney, Dr. R. K. Macpherson, lecturer in environmental health, School of Public Health and Tropical Medicine, University of Sydney, Mr. L. G. Dwyer, Director of Meteorology, Department of the Interior, Melbourne, and Mr. K. Davison, Deputy Commonwealth Statistician, Bureau of Census and Statistics, Sydney, for information and advice; Mr. L. Lumsdon, *Newcastle Herald* office, for an ink drawing; and Benger Laboratories (Fison's Chemicals Pty. Ltd.) for producing slides and help with typing.

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Medical Surveys.

MALIGNANT DISEASE IN CHILDHOOD.[1]

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AND

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MALIGNANT DISEASE in infancy and childhood is becoming a problem of increasing importance. It can be seen from an examination of the statistics listing the principal causes of death among children in the United Kingdom, in the United States of America and in our own country that, if accidents are excluded, cancer is one of the commonest causes of death in childhood. Up to the age of four years, the only natural causes of death that are more common than malignant disease are pneumonia and other respiratory diseases and congenital malformations of various kinds, and from that age onwards cancer is responsible for more deaths than any other disease that is met with during childhood.

The increasing importance of malignant disease as a cause of death is brought home forcefully by Figure I.

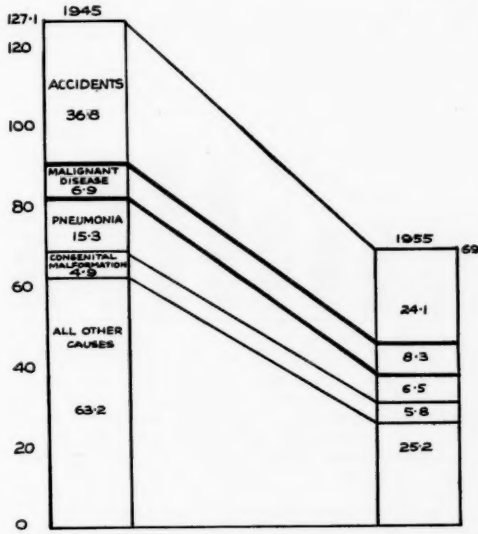

FIGURE I: Mortality in childhood in the United States of America (modified from Nelson, 1959).

Here it can be seen that in the United States of America there has been an increase in the number of registered deaths from malignant disease from 6·9 to 8·3 per 100,000 children between 1945 and 1955, whereas in the same time the total number of deaths has dropped from 127·1 to 69·9 per 100,000 children. Expressed as a percentage we see that, whereas in 1945 malignant disease was registered as causing 5·4% of all deaths in children under the age of 14 years, in 1955 it was responsible for 11·9% —more than double the figure.

An examination of our figures (Figure II) indicates that there has been a progressive increase in the number of cases of malignant disease passing through the Royal Alexandra Hospital for Children each year. However, it would not appear that this increase is necessarily due to any natural increase in the incidence of malignant disease and it is probable that it can be explained in other ways. In spite of the increased mortality and the increased number of such patients admitted to hospital, as shown in the figures above, there is as yet no conclusive evidence that there has been an absolute increase in the incidence of malignant disease in this age group. Available figures are obscured by such factors as correct diagnosis and documentation, diminished mortality from many infectious diseases since the introduction of chemotherapy, a sharp increase in the population during the last 15 years and the more frequent admission to hospital of such patients, owing to the improvement in diagnostic and therapeutic facilities.

Sex Incidence.

An examination of our figures indicates an over-all male preponderance of approximately 3:2, and this is in accordance with many other similar series. However, an examination of Lancaster's figures for mortality of childhood in Australia indicates that there is a male preponderance very comparable to the figure quoted above

[1] Based on Publication Number 5 of the New South Wales State Cancer Council.

for malignant disease, so that it is doubtful whether this figure is of any significance, although in specific groups of tumours a definite preference, usually for the male sex, can be shown to exist.

An examination of Figure III shows that in the first year of life more than twice as many male children died from malignant disease and this is possibly of some significance, although the numbers are relatively small. It can also be seen that in cases of leukæmia occurring

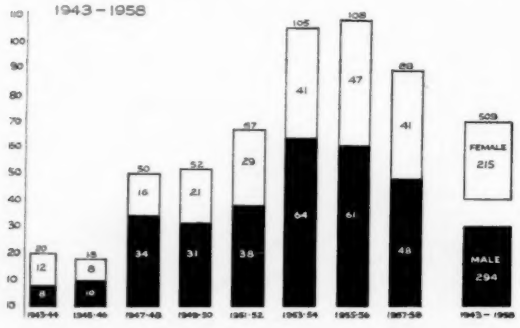

FIGURE II: Admissions to the Royal Alexandra Hospital for Children of cases of malignant disease during two-year periods from 1943 to 1958.

in children under the age of one year there appears to be a significant male preponderance (Figure IV). However, figures available from other centres do not, in general,

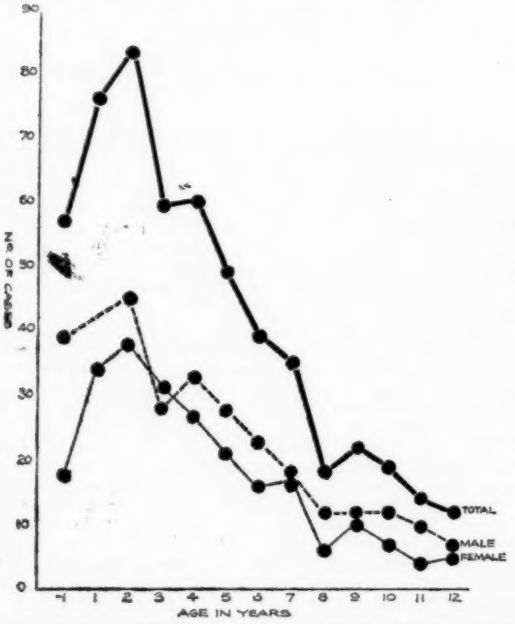

FIGURE III: Cases of malignant disease in childhood (all ages) treated at the Royal Alexandra Hospital for children between 1945 and 1959.

support this. Lymphosarcoma and neuroblastoma both showed a significant male preponderance, but the most striking group in this regard was Hodgkin's disease, which is extremely rare in female children.

Age Incidence.

One striking fact that has arisen from this survey, and which is also shown in other similar series, is the relatively high incidence of malignant disease in the first five years of life. This undoubtedly emphasizes the embryonal nature of the more common tumours of childhood. There is a high peak incidence of malignant disease between the ages of one and two years, after which the numbers fall fairly sharply, and after the age of seven years malignant disease becomes relatively uncommon and the embryonal type of tumours exceedingly rare. The majority of tumours seen in this latter age group are lymphomas or cerebral tumours, but it is important to realize that tumours such as neuroblastoma and Wilms's tumour, although rare after the age of five years, may still occur and should not be entirely discounted as diagnostic possibilities because of the age of the child.

Familial Incidence of Malignant Disease.

It is recognized that retinoblastoma may be transmitted along Mendelian lines. However, with this one exception, we have been unable to discover any sugges-

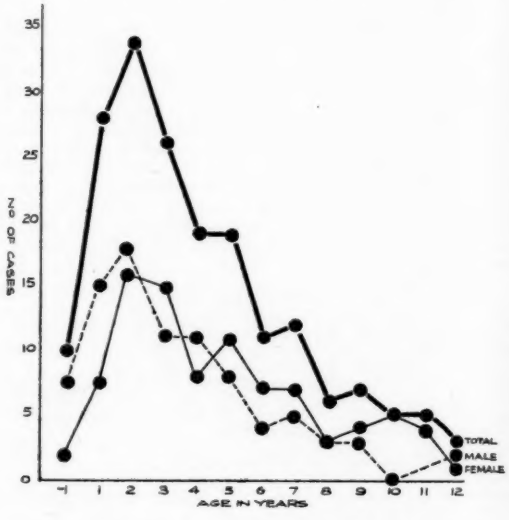

FIGURE IV: Cases of leukæmia in childhood (all ages) treated at the Royal Alexandra Hospital for Children between 1945 and 1959.

tion either of familial incidence of any other type of malignant disease seen in childhood or of any familial tendency to the development of malignant disease of different types. It would therefore appear justifiable on the basis of present knowledge to assure parents that their chance of having other children afflicted in a similar manner is infinitesimal.

Classification of Malignant Disease in Childhood.

The survey that forms the basis of this report covers approximately 550 cases of proven malignant disease, and it has been found convenient to subdivide these into 16 groups. As will be seen from an examination of the material presented there is, of necessity, some overlap between these groups. It has been found, nevertheless, that more than 75% of all cases of malignant disease can be placed into one of five large groups.

By far the commonest disease was leukæmia and virtually all the leukæmias encountered were of the acute variety, the majority being lymphoblastic in nature. The next most common group was that of the cerebral tumours and the number indicated here is far below the true total, since this survey has been restricted to the pathologically proven cases. Many cerebral tumours in this hospital are not submitted to biopsy, and autopsy may not be performed. This particularly applies to the tumours affecting the brain stem, so that the actual number of

cerebral tumours is in point of fact considerably in excess of the number shown here. Lymphosarcomas, Wilms's tumours and neuroblastomas constitute the other three large groups of malignant diseases of childhood and are almost equal in their incidence. There would appear to be a significant male preponderance in the case of both lymphosarcoma and neuroblastoma.

Table I shows the distribution of cases in the larger groups under discussion. If we include Hodgkin's disease with the lymphomas and retinoblastoma with cerebral tumours, then 86% of all cases fall into the five major categories, rhabdomyosarcomas and malignant teratomas being the only other groups of significant size, and no other group constituting more than 2% of the total.

TABLE I.

Incidence of Various Malignant Diseases in Present Series.

Malignant Disease.	Number of Cases.		
	Male.	Female.	Total.
Leukæmia	94	90	184
Lymphosarcoma	37	19	56
Hodgkin's disease	21	2	23
Wilms's tumour	27	27	54
Neuroblastoma	32	18	50
Cerebral tumours	45	34	79
Retinoblastoma	13	6	19
Rhabdomyosarcoma	7	10	17
Bone tumours	5	3	8
Miscellaneous	33	26	59
Total	314	235	549

Although hepatoblastomas, malignant ovarian and testicular tumours, soft-tissue sarcomas and bone sarcomas are well recognized as occurring in childhood, in point of fact they are rare tumours. Although carcinomas and malignant melanomas are uncommon before puberty, it is important to realize that they do occur and must on occasions be considered as diagnostic possibilities.

It has proved convenient to adopt the following classification of malignant disease in childhood.

1. Leukæmia.
   (*a*) Lymphatic.
   (*b*) Myeloid.
   (*c*) Undifferentiated.[a]
   (*d*) Miscellaneous.
2. Malignant Lymphomas.
   (*a*) Lymphosarcoma and Reticulum Cell Sarcoma.
   (*b*) Hodgkin's Disease.
   (*c*) Reticuloses.
3. Tumours of Nervous Tissue.
   (*a*) Central Nervous System Tumours.
   (*b*) Peripheral Nerve Tumours.
   (*c*) Retinoblastoma.
4. Wilms's Tumour.
5. Neuroblastoma.
6. Teratomas.
7. Gonadal Tumours.
   (*a*) Ovarian.
   (*b*) Testicular.
8. Other Malignant Genito-urinary Tumours.
9. Tumours of Liver, Pancreas and Adrenal Tissue (other than Neuroblastoma).
10. Rhabdomyosarcoma.
11. Bone Tumours.
12. Soft-tissue Sarcoma.
13. Malignant Melanoma.
14. Angiosarcoma.
15. Carcinoma.
16. Unclassified.

[a] Leukæmias in childhood are almost always acute and it is frequently impossible to classify them on a pathological basis. In such instances their response to treatment will determine whether they are of lymphatic origin or not.

Leukæmia.

The age and sex incidence of leukæmia are shown in Figure IV. The clinical vagaries of leukæmia are well known and this is well illustrated if one examines the diagnosis made on the patient's admission to hospital. In our cases, such diagnoses as nephrotic syndrome, spontaneous fracture, appendicitis, meningitis and osteomyelitis indicate the variable presenting symptomatology. However, the following classical modes of presentation have been noted: (i) onset following "infection", (ii) clinical presentation as "rheumatism", (iii) presentation as a hæmatological problem.

In several instances the symptoms were first noted after a febrile illness, usually upper respiratory in nature. After the acute illness it was noted that the child failed to regain his normal health and activity, and further investigation revealed the true nature of the illness. In all of these cases the parents asserted that the child was perfectly well before the illness, but it is impossible to decide whether such an illness did, in fact, mark the onset of the disease.

In many cases rheumatic fever was the provisional diagnosis on admission to hospital, the symptoms being fever, malaise, tiredness, limb pains and sometimes swollen joints. Such symptoms are present in the majority of cases of leukæmia, but in the ones referred to here the rheumatic pattern was so definite that actual difficulty was experienced in the diagnosis, especially when the original blood counts showed no definite evidence of leukæmia. In most of these cases a raised erythrocyte sedimentation rate was found and varying heart murmurs were heard. The main difficulties were met with in those patients with obvious signs of joint involvement—isolated, multiple or symmetrical. Differentiation from Still's disease was difficult at times, especially in patients with a more chronic course and negative findings in the peripheral blood.

Many patients presented with some form of hæmatological disorder in which the original blood examination did not reveal the presence of leukæmia. Such cases presented either as an acute hæmolytic anæmia or with some reduction in one or more of the cellular elements, various combinations of anæmia, neutropenia and pancytopenia being found. In nearly all of these cases continuous symptoms were present, such as fever, pallor, bruising, soreness of the limbs and tiredness. A few children were admitted to hospital with the diagnosis of idiopathic thrombocytopenic purpura, but the blood counts performed at this hospital all revealed blast cells in the peripheral blood. In only a few cases was enlargement of liver or spleen or generalized lymphadenopathy sufficiently striking to attract attention in the early stages. In slightly less than half of the cases was leukæmia diagnosed early in the disease on the result of the original peripheral blood examination. Analysis of the presenting symptoms in these cases revealed that significant pallor was present in all, and constitutional symptoms such as lethargy, irritability, anorexia, fever, limb pains and headache were also present in almost every instance. This indicates the insidious nature of the disease in its early stages and emphasizes the necessity for the prompt investigation of any child with symptoms which are not promptly resolved by treatment, particularly when anæmia is present. It is once again emphasized that the peripheral blood picture may be quite non-specific in many instances.

Treatment.

It is possible at this stage to discuss treatment only in very general terms, since no analysis of treatment or follow-up of cases has yet been carried out in a detailed manner. Prior to the introduction of chemotherapy, treatment was along symptomatic lines, some patients

receiving blood transfusion and antibiotics and some patients being untreated. For the last few years the basis of treatment has been corticosteroid therapy, with or without 6-mercaptopurine administration, with a maintenance dosage of steroids or 6-mercaptopurine. In a few instances other chemotherapeutic agents have been utilized.

It has now been clearly shown that a significant prolongation of life can be achieved by the use of chemotherapy, and that the remissions induced in this manner usually allow the children to be maintained free of discomfort and constitutional symptoms until a relapse occurs. In some instances the remission is prolonged and, on occasions, a second or even a third remission may be induced by the exhibition of an alternative chemotherapeutic agent.

On occasions remissions will occur with steroid therapy alone, and remissions induced by steroids are usually quicker and more definite than those following antimetabolite therapy. However, in many cases, steroids and antimetabolites are combined to achieve the maximum benefit.

Malignant Lymphoma.

The mode of presentation of malignant lymphoma is largely determined by the site of the primary tumour. One-third of the cases of lymphosarcoma terminated with the peripheral blood picture being one of acute lymphatic leukæmia. This was particularly noticeable in cases of lymphosarcoma of the thymus. When the primary tumour was abdominal, the main features were abdominal pain and vomiting, together with signs of incomplete intestinal obstruction. Patients in whom the primary tumour was mediastinal or thymic frequently presented with signs of mediastinal compression, lobar or total pulmonary collapse being a common sign in the early stages. Some of these patients presented with a massive pleural effusion, usually blood-stained, and in such instances malignant cells could frequently be obtained from the exudate.

Presenting symptoms were cough, chest pain, dyspnœa and cyanosis, usually with fever and loss of weight. Although the onset was frequently insidious, in some instances it was quite sudden, particularly when pulmonary collapse had occurred. Some patients first presented with a peripheral tumour, usually due to lymphatic gland involvement, the diagnosis being made on biopsy. In a few instances the presenting picture was that of a generalized constitutional disturbance, with fever, limb pains and anæmia, resembling the clinical onset often seen in leukæmia or neuroblastoma.

Treatment.

It is possible at the moment only to lay down certain principles on which treatment is based, as the details of chemotherapy are certain to be modified in the light of further experience. All large tumour masses are treated as soon as possible with radiotherapy. These tumours are invariably highly radiosensitive, and a short course, usually not exceeding 3000 to 4000 *r*, is usually adequate to produce prompt disappearance of the tumour mass. Steroid therapy should be commenced at an early stage. Whenever a peripheral lymph node or tumour deposit is readily accessible, the diagnosis should be promptly confirmed by biopsy. This can, in some instances, be achieved by bronchoscopy in cases involving the tracheo-bronchial tree.

After any large tumour mass has been adequately controlled by radiotherapy, chemotherapy should be commenced without delay, regardless of whether any residual tumour is present or not. The drug of choice at present would seem to be one of the polyfunctional alkylating agents, either "Leukeran" or "Endoxan", the latter seeming to be most effective as a large single dose repeated at intervals of one to three weeks. If a quick response is not obtained with one agent, a change to another should promptly be made, as the reaction in each individual case cannot be predicted. A close watch should always be kept on the blood count and bone marrow, and any significant depression, particularly in platelets or leucocytes, or the appearance of primitive cells in the peripheral blood is an indication for discontinuing the administration of cytolethal agents until the picture reverts to normal.

Hodgkin's Disease.

Usually painless enlargement of one or more groups of peripheral lymph nodes is the presenting sign that first brings the child with Hodgkin's disease under observation. Involvement of other gland groups usually follows, although the rate of extension shows considerable variation from case to case. The enlarged glands are usually discrete and of firm, rubbery consistency, and it is uncommon for them to be tender. On occasions the gland group involved may not be obvious, as is the case when the disease commences in the mediastinal or deep abdominal glands. In such cases pressure of the enlarged glands on surrounding structures or the presence of unexplained splenomegaly may be the first signs.

The duration of the disease varies considerably, some cases running an acute course and others a protracted one over several years. Although the prognosis is usually poor, long-term survival is possible in some instances. In general the hæmatological picture is non-specific in the early stages, there being either no abnormality or moderate hypochromic anæmia and sometimes mild to moderate leucocytosis.

Treatment.

Both radiation therapy and chemotherapy with one of the polyfunctional alkylating agents are advocated. It would appear justifiable to advise surgical removal of the involved gland group, followed by radiation therapy, in those rare instances in which the disease presents in a localized form. In generalized Hodgkin's disease it would appear to us that chemotherapy is the treatment of choice, particularly when the progress is rapid. Radiation therapy should, in general, be reserved for relatively localized disease beyond the scope of radical surgery, for the symptomatic treatment of large mediastinal or abdominal gland masses or for gross splenomegaly.

Tumours of the Central Nervous System.

With the exception of leukæmia, tumours are more commonly found in the central nervous system than in any other site during childhood.

Unlike leukæmia, neuroblastoma and Wilms's tumour, cerebral tumours do not show the classical peak incidence in the early years of life, and although, as can be seen from Figure V, they are most common in children around the age of two years, there is a much more even distribution of cerebral tumours through the pædiatric age group than is found with any of the other common groups of tumours.

The distribution and site of cerebral tumours in childhood differ very significantly from the distribution and site of those seen in adult life. Seventy *per centum* of cerebral tumours seen in our series were subtentorial, but nevertheless there was still a significant number of tumours in the cerebral hemispheres. Subtentorial tumours can be divided into tumours of the cerebellar hemispheres—which are astrocytomas of varying grades of malignancy, not infrequently cystic—and tumours of mid-line origin—medulloblastomas, anaplastic gliomas or ependymomas. Anaplastic gliomas also rise from the pons and brain stem in this region.

Seventy intracranial tumours were included in this series; of these 42 were astrocytomas (11 cystic astrocytomas, 15 solid astrocytomas and 16 anaplastic gliomas), 14 were ependymomas, 10 were medulloblastomas, two were craniopharyngiomas, one was an oligodendroglioma and one was a papilloma of the choroid plexus. Again, 48 were subtentorial (45 occurring in the cerebellum and fourth ventricle and three in the pons and brain stem), nine were in the cerebral hemispheres, four were in the hypothalamus and third ventricle, three were in the spinal cord, one was in the meninges and the situation of five was not stated.

Tumours of the cerebral hemispheres are relatively uncommon in comparison with subtentorial tumours, but are not as rare as suggested by some authorities. Tumours of the hypothalamic region form a small but distinct group, including gliomas of the optic nerve, craniopharyngiomas and ependymomas arising from the third ventricle. An analysis of tumour types indicates that by far the biggest groups were the astrocytomas; these varied very widely in their pathological appearance, some tumours being well differentiated and cystic in nature,

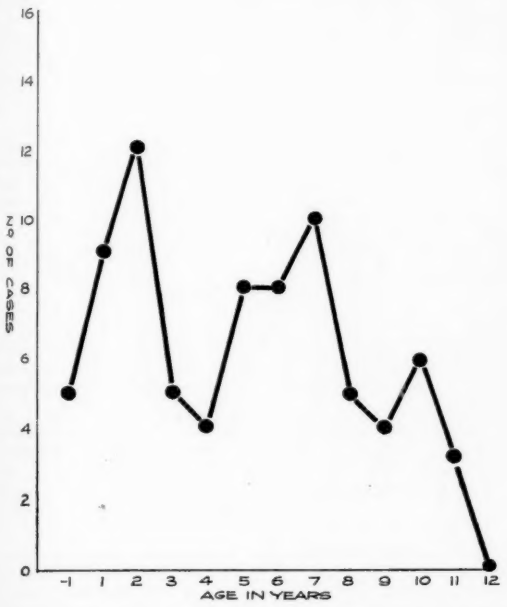

FIGURE V: Cases of cerebral tumour in childhood (all ages) treated at the Royal Alexandra Hospital for Children between 1945 and 1959.

while at the other extreme some tumours were obviously highly malignant and consisted of primitive pleomorphic cells. The ependymomas were the next most common group seen and also varied considerably in their degree of malignancy, the most active tumours being referred to as ependymoblastomas. Medulloblastomas were also relatively common and are undoubtedly very much underrepresented in our series for reasons already stated. They tend to be much more uniform in character and the vast majority appeared to arise from the region of the fourth ventricle or cerebellar vermis.

The presenting symptoms may be extraordinarily diverse in cerebral tumours of childhood. Vomiting is a very common presenting sign. In the early stages it may be intermittent and it is frequently precipitated by changes in posture. It may frequently be confused with vomiting of gastro-intestinal origin and may, on occasions, be projectile. In older children headache is not infrequently a presenting symptom. Irregularities of gait, clumsiness, alterations in behaviour and, not infrequently, symptoms suggestive of an infective condition are all common presenting features. Many intracranial tumours of childhood run a rapid course, but this is not invariably the case and it is possible to alter significantly the progressive nature of the condition in many instances by the application of suitable therapy.

Retinoblastoma.

Retinoblastoma is of particular interest because it has been well substantiated that, in some cases, there is a strong familial incidence. Although retinoblastoma may occur sporadically, if any of these children subsequently survive and marry there is a strong probability that a significant number of their offspring will suffer from the condition in a bilateral form. This should always be made clear to the family in such instances. This would appear to be the only malignant tumour in which an undoubted hereditary factor can be incriminated. Most authorities have indicated that the tumour occurs almost exclusively in infants and young children, and although in general this is so, we have occasionally seen cases in children up to the age of five years.

There is little to add to the classical description of the child presenting with a peculiar yellow reflex of the pupil and defective vision. The tumour spreads along the optic nerve to involve the intracranial contents and this, in general, determines the prognosis.

Neuroblastoma.

Neuroblastoma is extremely protean in its manner of presentation. Constitutional symptoms of varying degree, irritability, pallor and anæmia were usually present in the cases in this series. In several cases the diagnosis was difficult and delayed, and conditions such as rheumatism or leukæmia were frequently suspected. Leucocytosis and intermittent fever were also not uncommonly present.

A relatively common mode of presentation is as an abdominal mass, not infrequently multiple, and in these instances X-ray examination may show scattered calcification in the tumour. Some patients, particularly small infants, may present with gross hepatomegaly with or without jaundice. A peripheral glandular or soft-tissue swelling is a not uncommon mode of presentation. Biopsy will confirm the malignant nature of such swellings, although, in some instances, the extremely primitive nature of the pathological picture will preclude a precise diagnosis of the underlying cause. Another relatively common presentation is pain in the hip or limbs, usually without any local clinical signs. X-ray examination of the long bones was of diagnostic help in most of the cases in our series, and some degree of anæmia was usually present.

Unilateral ptosis may be an important early sign, particularly when the primary tumour is situated in the intrathoracic sympathetic chain. Proptosis, due to the presence of orbital metastases, commonly occurs during the course of the disease and may, on occasions, be the presenting sign, as may superficial nodules in the skull elsewhere.

Treatment.

It would appear that treatment has a great deal to offer in this disease, even when generalized dissemination has taken place. It should always be remembered that maturation to a fully differentiated ganglioneuroma or, alternatively, complete disappearance of the growth, is well recognized as occurring in neuroblastoma, and there are numerous well-documented instances to support this. In addition, the work of Bodian would suggest that regression may possibly be induced by the therapeutic measures employed.

There would therefore appear to be valid grounds for regarding every neuroblastoma as one that may mature or regress, provided that the patient lives long enough to allow this to occur. There would also appear to be good reason to believe that the removal or destruction of the primary tumour may significantly affect the progress of secondary tumours already present, as Farber suggests.

We would therefore base our approach to treatment on the following premises. (i) Whenever possible the primary tumour is excised as completely as possible, whether secondary tumours are already present or not. If complete excision is not possible, full therapeutic doses of X rays are employed in an effort to destroy the primary tumour as completely as possible after the diagnosis has been confirmed by biopsy. (ii) Any large accessible secondary tumours (for example, orbital metastases) are given palliative radiotherapy, as this reduces their size more rapidly than any other measures available. (iii) Vitamin

B_{12} (1000 μg. every two days) may be given as recommended by Bodian. Although some authorities question the efficacy of this therapy it can certainly do no harm. (iv) Corticosteroids are given whenever widespread dissemination has occurred, as considerable symptomatic relief is produced thereby. (v) Chemotherapy is used for widespread dissemination, the drug of choice at present being "Endoxan", preferably in a large weekly dose followed by smaller doses by mouth if improvement occurs.

Wilms's Tumour.

Unlike the other commonly encountered malignant diseases, Wilms's tumours are reasonably constant in their mode of presentation. The child is usually brought along to the physician because the parents have noticed a sudden rapid increase in the size of the child's abdomen or because they have detected a large mass on one side of the abdomen. Although microscopic hæmaturia may be discovered on routine examination of the urine in a considerable number of cases, this is rarely sufficient to produce any macroscopic change in the colour of the urine. Hypertension of significant degree will also be found in a proportion of cases if it is looked for. Many patients show a severe degree of anæmia when first examined, which is presumably due to hæmorrhage in the tumour, and this may also be responsible for the rapid increase in the size of the tumour which apparently occurs in many instances. Apart from anæmia the tumour rarely produces any general disturbance until late in the disease, when there may be some weight loss and respiratory symptoms may occur owing to the presence of lung metastases.

Metastases occur very constantly in the paraaortic glands, both in the abdomen and in the thorax, and also in the lungs. Invasion of the renal vein is a bad prognostic sign, since it indicates that massive hæmatogenous dissemination has taken place.

Treatment.

It is believed that the treatment of Wilms's tumour is a matter of some urgency once the diagnosis is suspected, and indiscriminate palpation of the tumour should be prohibited as it may well encourage metastatic dissemination. An intravenous pyelogram and examination of the blood should be carried out without delay, and transfusion of whole blood should be given immediately if any severe degree of anæmia is present. A routine X-ray examination of the chest should be made to exclude the presence of metastases, and if any doubt exists as to the diagnosis, the long bones and the skull should also be examined radiologically, since neuroblastoma commonly shows evidence of metastatic spread to bone.

Chemotherapy should be commenced forthwith and it is believed that, at the moment, actinomycin D is the drug of choice for this purpose. Operation should be performed on the following day, and it is strongly recommended that an abdomino-thoracic incision with a transperitoneal approach to the tumour should be employed in order to obtain control of the renal pedicle at as early a stage as possible. At operation the tumour will be found to be large, coarsely lobulated and encapsulated, and it is usually technically feasible to remove it without disruption of its capsule.

Radiation therapy should be commenced on the same day, whenever practicable, and when the tumour has been removed with its capsule intact, should be directed to the paraaortic lymph nodes in the abdomen and thorax with careful screening of the contralateral kidney. When the capsule has been ruptured during removal of the tumour, the area from which it has been removed must also be irradiated, but this will almost always cause significant depression of the bone marrow because of the extensive area involved, and will limit the total radiation dosage that may be safely employed.

If pulmonary metastases subsequently appear they should also be attacked vigorously, with a combination of radiation therapy, chemotherapy and possibly surgery, and there have been many well-recorded instances in which long-term survival has followed such a positive approach.

Rhabdomyosarcoma.

Rhabdomyosarcomas form an interesting group readily divisible into four types.

The first of these affects voluntary muscles, particularly in the limbs, is of high grade malignancy and metastasizes early, mainly to the lymph nodes and bones. This tumour is almost invariably extremely resistant to radiation therapy, but may show a temporary response to chemotherapy. Most patients survive for less than a year after the diagnosis has been made and, in the majority of instances, the condition progresses with great rapidity.

The second type is the classical sarcoma botryoides, which originates in either the base of the bladder or the vault of the vagina, and often first presents as a series of grape-like protrusions from the vagina, often preceded by or associated with significant bleeding. Although this is a variant of the embryonal type already described, it tends to extend locally rather than to metastasize, and may go on to infiltrate the entire pelvic cavity, death not infrequently being due to the complications resulting from obstruction to the alimentary or urinary tract.

There is a third type which arises in the orbital muscles. These tumours also tend to extend locally and to recur locally after removal, metastases being a late feature.

The fourth type is the tumour occurring in the testis, which will be discussed under the heading of gonadal tumour.

It is doubtful whether extensive and mutilating surgery is justified in these cases because of the extremely poor prognosis, and it is our belief that local or general chemotherapy is to be preferred.

Malignant Teratomas.

The commonest sites for malignant teratomas are the gonads and the sacro-coccygeal region. The sacro-coccygeal tumours frequently present with obstructive symptoms relating to the bowel or genito-urinary tract, resulting from the presence of a large pelvic mass. Secondary tumours may develop throughout the abdomen and metastases in the lungs commonly appear, with rapid deterioration in the patient's condition. Paraplegic signs not uncommonly appear from spinal cord involvement. Teratomas of the gonads will be discussed under that heading.

Gonadal Tumours.

Ovarian tumours occur most frequently in the latter half of childhood and are relatively rare. Widespread metastases within the abdomen usually occur and a rapid downhill course is the rule. They are more common in the latter half of childhood.

Malignant tumours of the testis, on the other hand, are most often seen in very young children, usually under the age of one year. Painless swelling of the testis is the presenting sign and, on examination, a solid tumour of the testis is discovered, not infrequently with some thickening in the cord. These tumours are usually embryonal carcinomas arising in teratomas of the testis or rhabdomyosarcomas. The testis and cord should be removed in such instances, and although spread may occur either to the paraaortic glands or via the blood-stream to the lungs, many tumours appear to be restricted to the testis at the time of removal.

Malignant Tumours of the Liver.

Primary malignant hepatic tumours most commonly occur in children under the age of two years, but they can occasionally appear in older children. These children present with unexplained hepatomegaly usually not associated with jaundice, and the results of liver function tests are extremely variable, depending upon the amount of residual functional liver tissue. The history is com-

paratively short as a rule, but in spite of this the liver is usually grossly enlarged when the child first presents. Apart from the abdominal findings, there is often surprisingly little general disturbance.

The tumour is most commonly an embryonal carcinoma and, although a temporary response to radiation therapy or chemotherapy may be achieved, it does not appear to delay materially the progress of the condition.

Malignant Bone Tumours.

Malignant primary bone tumours are relatively uncommon before puberty. They usually occur in children over the age of five years and the most common type of tumour found is osteogenic sarcoma. Ewing's tumour does occur in children, but it is extremely rare. It is possible that the prognosis of osteogenic sarcoma may not be so bad before puberty, since several of the patients treated at the Royal Alexandra Hospital for Children have survived for many years after various forms of therapy.

Pain is invariably the presenting symptom and is frequently related to some minor traumatic incident. The pain is very typically of an intermittent nature and tends to be worse at night. A local swelling is palpable. The radiological appearance of the lesion is usually extremely characteristic, although, in some cases, considerable difficulty may be experienced in differentiating the lesion from chronic osteomyelitis. Local tenderness and swelling, together with low-grade fever and leucocytosis, may be common to both conditions. The lower end of the femur is the site most frequently involved and metastases occur most commonly in the lungs.

Opinions vary as to whether immediate amputation or preliminary intensive radiation therapy followed by amputation is the treatment of choice. The recent introduction of tumour perfusion in the isolated limb, a technique utilizing a heart-lung machine, would appear to have much to recommend it in these cases.

Soft-Tissue Sarcomas.

Soft-tissue sarcomas consist in the main of fibrosarcomas of varying grades of malignancy. The majority of these tumours appear to be only locally malignant and, in general, seem to have very little tendency to metastasize. Wide local excision is satisfactory in this group, and more radical procedures should not, in general, be undertaken.

Fibromas of infancy, which present as firm, infiltrative tumours with poorly defined boundaries, should be excluded.

Carcinoma.

Carcinoma is rare in the pædiatric age group. When adult-type carcinomas occur in children, they are usually extremely active and run a rapid course, metastasizing early.

Malignant Melanoma.

There is no doubt that malignant melanomas are activated after puberty and are rare in childhood. However, juvenile melanomas are not at all uncommon in children, and their active microscopic appearance not infrequently leads to a mistaken diagnosis of malignancy unless the pathologist is thoroughly familiar with this lesion as seen in childhood. However, malignant conversion can, on occasions, occur before puberty, and we have seen a small number of cases in which invasion of blood vessels within the tumour by tumour cells or the presence of metastatic deposits in neighbouring lymph glands indicated undoubted malignancy. Even then, wide local excision of the primary tumour, together with the removal of involved lymphatic glands, if present, will often result in prolonged survival without any evidence of recurrence, so that, even in cases of undoubted malignancy, the prognosis is much better before puberty.

In addition, one not infrequently sees juvenile melanomas which have increased in size or ulcerated, or round which satellite growths have appeared, or the primary tumour may be in an unusual situation—such as sole of the foot, the palm of the hand or the external genitals. In all these instances prophylactic local excision of the tumour, together with an adequate margin of healthy tissue, is advocated because of the very real risk that malignancy may supervene after puberty.

Acknowledgements.

This article is based on a survey that was undertaken at the request of the New South Wales State Cancer Council under the auspices of the Institute of Child Health at the Royal Alexandra Hospital for Children (Publication Number 5) and is published with its permission. We wish to acknowledge the assistance and advice of Dr. Alan Lilley and Mr. Kenneth Starr of the New South Wales State Cancer Council and Professor Lorimer Dods of the Institute of Child Health, who have spent much time with us in discussing various aspects of this problem during the survey and the compilation of the report on which this article is based.

We wish specially to acknowledge the part played by Dr. Douglas Reye, director of pathology at the Royal Alexandra Hospital for Children, without whose cooperation this survey would not have been possible. He very generously made available the records of the Institute of Pathology and subsequently spent many hours with us reviewing and discussing almost every case included in this survey to ensure that the pathological findings were accurate. Of great value in this survey is the fact that Dr. Reye has been in charge of the pathology department during the entire period covered, which ensures uniformity and a high standard of diagnostic accuracy in the pathology findings included herein.

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Reviews.

Clinical Methods of Neuro-Ophthalmologic Examination. By Alfred Kestenbaum, M.D.; second edition; 1961. New York, London: Grune & Stratton. 10" × 6¾", pp. 590 with illustrations. Price: $16.75.

WHEN the first edition of this book appeared in 1946, it was a closely-written volume of 384 pages. The second edition, 1961, presents so much new material that it has increased to 577 larger pages. The biggest increase is in the first section, where "Anatomy of the Optic Pathway" has been increased from 22 pages to 72 pages of "Neuro-Ophthalmic Anatomy". The presentation remains in the same style, except that the headings of the main paragraphs are absorbed into the text to make the printing tighter. There are no photographs, and apart from schematic anatomical diagrams there are few illustrations. In places the phrasing is strange and resembles that seen in some translations from European textbooks. The various tests are arranged numerically and their explanations are clear. The first edition was based on lectures, and the second edition is based on the first, but the new book has become almost encyclopædic. Some of the older methods of examination could have been discarded, not only because they are less useful, but because the inclusion of so many tests leads to bewilderment in the learner.

Kestenbaum is recognized throughout the world as an authority on neuro-ophthalmology, and his book presents the results of many years' experience and study. All who are interested in this field can read the book with much profit. A glossary of 17 pages will greatly assist beginners to master new terminology, and the bibliography of 27 pages should satisfy the most diligent seeker.

Clinical Endocrinology for Practitioners and Students. By L. Martin, M.D., F.R.C.P.; third edition; 1961. London: J. & A. Churchill Ltd. 8½" × 5½", pp. 276 with illustrations. Price: 28s. net (English).

IN his preface to this third edition Laurence Martin states that the aim is to be "the presentation of a concise and practical account of endocrine disease from the view point of a general physician". Comparison with the previous edition (1954) discloses substantially little change, except for omission of two short chapters on the pineal and hormone implantation and the inclusion of a section on human sexual development. This book preserves the essential format of previous editions with its excellent clinical photographs.

However, one cannot help feeling that the time has come for more discussion of the considerable advances in physiology of the endocrine glands made by clinical investigators over the past ten years. This work is giving clinical endocrinology a rational basis, which makes it much more readily understood by student, practitioner and investigator alike. To take an example, under the general heading of stress and the adrenal cortex there is a brief summary from a paper of Selye's which appeared in the *British Medical Journal* in 1950. There is no reference whatever to human work, such as the comprehensive studies of Francis Moore and others on the adrenal cortex and surgical trauma which appeared between 1952 and 1958. More serious is the complete absence of any discussion of steroid suppression of the adrenal cortex following steroid therapy. This is by far the most important practical clinical problem regarding the adrenal cortex which should have been included in any text of clinical endocrinology. Some discussion of the fundamentals of steroid metabolism in relation to the clinical assessment of 17-ketosteroid and 17-ketogenic steroid excretion should have been included. A general physician must know what these determinations mean, and he would expect to find out from a book such as this.

These examples could be accompanied by others which indicate a lack of coverage of recent literature—for example, the abandonment of elaborate calculations for dosage for radioactive iodine therapy, the use of long-acting esters of testosterone and the omission of the important discovery of the abnormal thyroid stimulator in thyrotoxicosis by Adams and Purves in 1958.

One regrets the fact that the author has largely ignored the American literature, with the exception of Lawson Wilkins's work on adrenal hyperplasia and recent work on genetics. Journals such as *The Journal of Clinical Endocrinology and Metabolism, The Journal of Clinical Investigation* and *Metabolsim* have published much important work in relation to clinical endocrinology over the past ten years. This literature should have been included and assessed in a book of this kind. It is true that the American literature is characterized by more laboratory work, but a sharp distinction between so-called clinical endocrinology and laboratory endocrinology can no longer be maintained.

The Practical Management of Head Injuries. By John M. Potter, M.A., M.B., B.Chir. (Cantab.), F.R.C.S.; 1961. London: Lloyd-Luke (Medical Books) Ltd. 7¼" × 5¼", pp. 84. Price: 12s. (English).

THE author has produced a monograph on the management of head injuries which is a departure from the usual medical publication. It is small in size, and as it is not enclosed in an expensive binding, the cost is reasonable. This custom, which is common in French medical publications, has much to commend it. The book fills a real need, for it makes up for many of the omissions in current textbooks.

An excellent description is given of the routine management of head injuries in both the casualty department and hospital wards. The procedures necessary for the observation and care of the unconscious patient are treated in detail, and this discussion provides an excellent guide for house surgeons, upon whom the responsibility for the management of head injuries largely rests. The procedures which are now accepted neurosurgical routines are well set out. The author emphasizes the fact that the abnormal neurological signs which should be observed in these patients are simply elicited and easily interpreted.

A simple description of the pathological processes going on inside the skull and a discussion on diagnosis might have enlarged the book, but would have increased its usefulness. For example, hysteria probably causes more confusion in the differential diagnosis of head injury than diabetic coma, but it is not mentioned.

Objection may be taken to the use of the term meningism, and it seems that too much reliance upon neck stiffness as indicative of subarachnoid hæmorrhage without confirmation by lumbar puncture could be confusing. The acceptance of the organic origin of a post-traumatic neurosis upon such a manifestation would cause medico-legal difficulties if the author's view became widely accepted.

Complications and their management are confined to one chapter, necessarily brief because this is a small book; but some expansion of the discussion of the clinical manifestations, especially with respect to the more acute forms of subdural hæmorrhage, would have been more helpful.

The final chapter on rehabilitation and assessment of the patient is clear and concise.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Clinical Hematology", by Maxwell M. Wintrobe, M.D., Ph.D., D.Sc.; fifth edition; 1961. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson Ltd. 10" × 7", pp. 1186, with 315 illustrations. Price: £10 3s. 6d.

"Novak's Textbook of Gynecology", by Edmund R. Novak, A.B., M.D., and Georgeanna Seegar Jones, M.D.; sixth edition; 1961. Baltimore: The Williams and Wilkins Company. 9" × 5¾", pp. 854, with 580 illustrations. Price: £8 5s.

"Experimental Science for the Blind: An Instruction Manual", by A. Wexler, M.Sc., A.R.I.C., published with the assistance of The Royal National Institute for the Blind; 1961. Oxford, London, New York, Paris: Pergamon Press. 8½" × 5½", pp. 97, with 51 illustrations. Price: 30s.

"A Student's Guide to Anatomy", by David Sinclair, M.A., M.D.; 1961. Oxford: Blackwell Scientific Publications. 7¼" × 5¾", pp. 98, with illustrations. Price: 7s. 6d.

"Immunity", by Sidney Raffel, Sc.D., M.D.; 1961. New York: Appleton-Century Crofts Inc. 9¼" × 6¼" pp. 672, with 125 illustrations. Price: $10.00.

"Metabolic Pathways in Microorganisms", by Vernon H. Cheldelin; 1961. New York, London: John Wiley and Sons Inc. 7¼" × 5¾", pp. 102, with many illustrations. Price not stated.

"A Manual of Neurology and Psychiatry in Occupational Medicine", by Ralph T. Collins, A.B., M.D., Med.Sc.D.; 1961. New York, London: Grune and Stratton. 8½" × 5½", pp. 254, with 10 illustrations. Price: $6.50.

The Medical Journal of Australia

SATURDAY, DECEMBER 23, 1961.

THE SEASON OF COMFORT.

UP and down the land at this time of year, in city halls and village centres, in cathedrals and little country churches, Handel's *Messiah* is enjoying its annual season. All sorts of audiences sit expectantly through its familiar preliminary chords to hear all sorts of tenors launch bravely into the opening recitative: "Comfort ye! Comfort ye, my people!" It is a stirring beginning and appropriate to the season, for comfort belongs very much to the spirit of Christmas. Unfortunately, by the sort of twisting of meaning that debases so many words, comfort is more often than not thought of in terms of hot-water bottles, soft mattresses, air-conditioning and the like—things that are all very nice in their way and useful in their place; but they are only part, and the lesser part, of comfort. Comfort in this sense, pursued for itself and by itself, can be softening and weakening, whereas the word in its root meaning implies the giving of strength. In this positive sense comfort offers ease and support to the body in order that it may renew itself, with consolation and encouragement to the spirit so that life may be faced and coped with.

This spiritual encouragement is just what Christmas brings to many. Orthodox Christians have, of course, no doubt about its meaning and implications, finding in it an assurance of the boundless goodwill of the Creator towards his creatures and the hope of mending human frailty by divine strength. They accept the primary meaning of Christmas, and the season is particularly and peculiarly theirs. Nevertheless, in some measure the whole community seeks to enter into the spirit of Christmas, and people of many faiths and points of view find comfort in it. The exchange of cards and greetings, while it can be shallow and meaningless, renews and strengthens many human links that are of far more than mercenary value to us, and even the hardest business relationships can be for a moment (would that they always were!) touched with something finer. Social gatherings, shoddy or superficial though some of them may be, bring friends together, open new doors for the lonely and shut-out, and break down unhappy barriers. Families are united in a way that is of the utmost importance in a society such as ours which finds its real strength in the family and yet pathetically neglects it. The exchange of gifts, the making of extra provision for the less fortunate and the special attention paid to children provide a salutary challenge to our generosity and bring not only passing pleasure but often much-needed encouragement and hope. The picture is, of course, not always so rosy in its detail as these generalizations might suggest, and it is no part of a healthy observance of Christmas to wallow in sentimentality. But we do well to realize that the season provides an opportunity for human relationships to be refined and strengthened, for generosity and high motives to be honoured and cultivated, for the strong to help the weak, for hope to be renewed, and for man to look outwards and upwards. It is the season of comfort. The only thing better than keeping it at its appointed time is to keep it all the year.

What has this to do with medicine? Everything, we would suggest, for in the matter of comfort medicine, if it is true to its heritage, does keep Christmas all the year. Comfort is of the very essence of medical practice, whether it is dispensed through the highest technical skill or in the simplest human relationship between doctor and patient, though it is on the personal level that it counts most. It was said many years ago that the doctor's duty is occasionally to cure, sometimes to alleviate, but always to comfort. Nowadays we cure more than occasionally, and we can usually alleviate, but "always to comfort" is no less important. It can never be unimportant to the good doctor.

Fifty years ago today, on Saturday, December 23, 1911, Captain R. F. Scott wrote in his diary: "I am feeling very cheerful about everything tonight. . . . To me for the first time our goal seems really in sight. . . . I trust this may prove the turning-point in our fortunes for which we have waited so patiently." He was then in the wastes of Antarctica leading a British expedition to the South Pole. Despite tremendous obstacles and hardship imposed by weather and terrain, the morale of the whole party was clearly as high as that of its leader. So it had been from the beginning of the expedition, and so it was to remain through even greater hardship, through the disappointment of being forestalled by the Norwegian Amundsen when they eventually reached the Pole on January 17, 1912, and through the disastrous return journey on which Scott, Edward Wilson, the medical officer of the party, and three others lost their lives. For a great deal of this high morale it seems clear that the credit must go (after Scott himself) to Edward Wilson—"the most valued and valuable of all", "the best fellow that ever stepped", in Scott's words. In a quiet, selfless way Wilson was able to give comfort that is strength, derived in its turn from a deep though unostentatiously held faith. He would have accepted for himself no credit for the comfort that he gave to others, yet he earned from one of his companions on that expedition the most fitting epitaph any doctor could have—"he was a gallant kind of gentleman upon whom you could lean". Edward Wilson habitually looked outward and upward and kept Christmas all the year.

AUSTRALIAN CANCER SOCIETY.

IT has repeatedly been shown that where it appears desirable that more should be done in a particular sphere, the formation of a society to bring together those interested and to stimulate activity leads to a profitable increase in the rate of progress in that sphere. In medicine this has led, in addition to the purely pro-

fessional bodies, to the formation of a variety of groups which include both lay and medical personnel, and some of these have behind them a very creditable record of achievement. It may seem a little curious to us now that tuberculosis should have been one of the earlier departments of medicine to attract this sort of attention. Medical journals of the early years of this century contain frequent references to societies whose aim was to promote campaigns against tuberculosis. Perhaps because of its diversity, cancer has been relatively late in becoming a field for this type of activity, but increased control of many other forms of disease has naturally led to a growing preoccupation with cancer, and this has resulted in the development of specialized instrumentalities to deal specifically with cancer problems. In the fields of joint lay and medical activity, this has meant in Australia the emergence of anti-cancer organizations at State level. The phenomenal success of the Victorian fund-raising campaign two years ago has set the Anti-Cancer Council of Victoria on its feet as a lusty prodigy; the New South Wales State Cancer Council is an active body which organizes research, and most other States have some corresponding organization. However, it is a familiar complication of Australian affairs that it is necessary to organize at both State and Commonwealth levels. This is not necessarily a handicap if the respective spheres of the two levels of organization are properly defined. In the present context, it was clearly highly desirable that there should be some body in the anti-cancer field which would speak for Australia as a whole, and which could act as intermediary and coordinate the activities of the various State anti-cancer organizations. It was largely because of the absence of such a body that the recent highly successful Victorian Cancer Congress, which was in fact an international gathering of some importance, had to be handled as a State project rather than as an all-Australian effort.

To remedy this defect a meeting was held in Canberra on October 19 last, attended by representatives of the various State anti-cancer bodies. In the absence of any other appropriate body, Queensland was represented by a nominee of the Queensland Radium Institute. The object of the meeting was to inaugurate the Australian Cancer Society, to decide on a constitution for the Society, and to make certain decisions as to the policy of the society. A report of the meeting is given on page 1028. It will be noted from this that the Australian Cancer Society is not an association of individuals, but of representatives of the several constituent bodies; these representatives constitute the Council of the Society. Other points of interest to which we might draw attention are the following. The Society does not propose to indulge in fund-raising activities on its own behalf, but will be supported by contributions from its constituent bodies. It will, however, assist by providing information and advice, and by any other appropriate means at its disposal, in the fund-raising activities of its constituent members. This is a good example of the proper division of function between State and Commonwealth levels; fund raising is to be the province of the State organizations. Councillor W J. Kilpatrick, who has provided so much of the driving force behind its formation, was elected first President of the Society, and Dr. B. S. Hanson of South Australia was elected Vice-President. The proposed scope of the Society's activities is indicated by some of the committees which are to be formed. One is the Medical and Scientific Committee, under the chairmanship of Dr. Hanson, another is the Committee for Education on Cancer, under the chairmanship of Mr. W. A. Dick of Victoria, and a third is the Committee for Service to Cancer Patients, under the chairmanship of Councillor Kilpatrick. These are the three main areas in which the activities of a society of this kind can be usefully deployed. It was agreed that a part-time medical director should be appointed, and that a secretary should be appointed after the first office was filled, as it would be appropriate for both appointees to be in the one State. It was decided to apply for membership of the International Union against Cancer for the Society, though some State organizations already enjoyed individual membership. Accreditation of the Australian delegation attending the World Cancer Congress to be held in Moscow in 1962 was discussed. It was noted that the 1966 World Cancer Congress would be held in Japan, and it was suggested that Australia should seek appointment as the host country for 1970; the chairman was authorized to explore the possibility.

Enough has been said to indicate the necessity for the Australian Cancer Society, and something of its potential fields of activity. We should like to congratulate those who have brought it into existence, and feel sure that it has an important role to play in coordinating and fostering the efforts being made in various fields of the fight against cancer.

Comments and Abstracts.

MALIGNANT DISEASES IN CHILDHOOD.

MALIGNANT DISEASE occurring between the ages of 5 and 14 years ranks second only to accidents as a cause of death in children in the U.S.A. and in Australia. Although there is no evident increase in the incidence of malignant disease in childhood, it has assumed an increasing importance as a cause of death because of a diminishing mortality from other diseases of childhood. Considerable interest therefore attaches to a retrospective study by Douglas Cohen and Charles Lee of 549 children admitted to the Royal Alexandra Hospital for Children because of various forms of malignant disease (see page 1015). This study is based on a booklet by Cohen and Lee recently published by the New South Wales State Cancer Council (Publication No. 5) with the title "An Investigation of Malignant Diseases in Childhood".

Cohen and Lee indicate that more than 75% of cases of malignant disease occurring during childhood may be placed into one of five large groups: leukæmia (the commonest form of malignant disease in their survey), cerebral tumour, lymphosarcoma, Wilms's tumour and neuroblastoma. They have compared the incidence of these diseases in their study with figures from the Hospital for Sick Children, Great Ormond Street, London, and have found a similar frequency of the main types, except for a higher incidence of cerebral tumour in the English series. Emphasizing the frequently insidious onset of leukæmia during childhood, they point out that no fewer than 17 of a total of 148 children suffering from leukæmia were diagnosed provisionally as rheumatic fever because of "fever, malaise, tiredness, limb pains and sometimes swollen joints". Also leukæmia was often ushered in by common infections; 35 children in this series failed to regain normal health after such illnesses as tonsillitis or

influenza. The presenting symptoms of cerebral tumours were found to be almost as diverse as those of leukæmia, ranging from vomiting with or without headache to "symptoms suggestive of an infective condition". Wilms's tumour differs from the other major groups of malignant disease in the constancy of the mode of presentation; the child's parents usually detected an abdominal mass, or at least a marked increase in the abdominal size. Neuroblastoma presented initially in this way in less than 25% of cases, and more often showed a variety of non-specific symptoms. The onset of lymphosarcoma varied greatly with the site of origin of the tumour.

The treatment of malignant disease in childhood is obviously a difficult problem. However, chemotherapeutic methods have changed rapidly in recent years and, together with surgery and radiotherapy, offer a chance of complete cure in a few cases (mainly neuroblastoma and Wilms's tumour) and valuable palliation in many others. The problems of therapy extend far beyond the use of these agents, and Cohen and Lee emphasize the importance of the child as an individual, the effects of his illness on the whole family and the need for a sympathetic understanding of these and other factors in arranging treatment.

At the Royal Alexandra Hospital for Children, Cohen and Lee have established a Cancer Registry, which was originally supported by the New South Wales State Cancer Council; the maintenance of this service is obviously of great value in the compilation of data related to childhood malignant disease in New South Wales. They also foreshadow the possible establishment at the same hospital of a consultative clinic in malignant disease which should be of great value to this State and to its children.

PREPARATION FOR MEDICAL EDUCATION.

THE report of the Committee on the Resurvey of Preprofessional Education in the Liberal Arts College, Association of American Medical Colleges, has been published[1] under the title "Preparation for Medical Education: A Restudy". This restudy has been carried out under the same ægis as the earlier one in 1953 and, with one exception, the group of liberal arts colleges, numbering 115, was also the same. The objectives were to define the qualifications that a student should have for a successful career in medicine, to ascertain the extent to which the pre-professional (liberal arts) colleges, by virtue of their selection, guidance and teaching, were producing this kind of student, and to make appropriate recommendations. The results of the restudy, which was evidently carried out with exceptional thoroughness, are presented in this scholarly work. Its publication at a time of unprecedented expansion of medical education is both timely and welcome.

To educators in our country, this book should provide a challenge. In the United States the medical student is generally an A.B. graduate before embarking on his medical course. The A.B. college course normally runs for four years and provides for the basic academic disciplines, mathematics and the natural sciences, language, literature, the fine arts, the social sciences, history, philosophy and religion. Most pre-medical students are exposed to a greater or lesser extent to these disciplines. Committee members compiling the report made personal visits to college campuses and found unhappily of many of the courses that they were little above the level of those offered in high school. They recommend that, in addition to his major field, each student should reach a relatively advanced level in one or two other subjects. The choice of subjects should not be such as unduly to slant the college course towards the later requirements of the medical curriculum. For a successful career in medicine, the most important qualifications are sincerity and integrity of personality and character, the strong motivation towards medicine necessary to sustain the student through the long years of study and, not least, sufficiently high academic abilities. The liberal arts colleges are meeting the admission requirements of the medical schools with varying degrees of success, but the majority of college graduates applying to medical schools still fail to gain admission; the percentage of those admitted rose from 38·4 in 1951-1952, the years covered by the original survey, to 44 at the time of restudy (1957-1960).

The committee's recommendations for the pre-medical liberal arts course are that it should be so designed as to prepare students for a good life, not merely to get a good job, and that the inroads of vocational training upon liberal education should be arrested and turned back. Detailed recommendations for the future are too numerous to cite, but these are clearly summarized towards the end of the relevant chapters. Australian readers will find much of interest, and we may hope that those charged with the responsibility of graduating doctors from our universities will give to this book the study that it clearly merits.

[1] "Preparation for Medical Education: A Restudy. The Report of the Committee on the Resurvey of Preprofessional Education in the Liberal Arts College, Association of American Medical Colleges", by A. E. Severinghaus, Ph.D., H. J. Carman, Ph.D., and W. E. Cadbury, Jnr., Ph.D.; 1961. New York, Toronto, London: The Blakiston Division, McGraw-Hill Book Company, Inc. 8¾" × 5¾", pp. 404. Price not stated.

FREE ASSOCIATION TO A FANTASIED PSYCHOTHERAPIST.

AN interesting inquiry has been made by A. Di Mascio and G. W. Brooks[1] into the feelings which may develop towards an unseen and unheard figure in the complete absence of any person in the room to whom the patient could relate. The subject in the inquiry was an obsessive-compulsive woman who had been under psychotherapy once weekly for six months and had improved to the stage of leaving hospital, but was not yet sufficiently well to hold down her shorthand-typing job and had to be placed in a day-care hospital programme. She was told only that she was being offered the opportunity to participate in a study which might help her to work out her problems. She was comfortably seated in a room equipped with a one-way mirror and an audio system, and was instructed to "free associate" and discuss openly any thoughts or feelings which came to her mind. She was told that while she could be seen and heard from the next room, she would probably never see or hear from the therapist in the next room. This study continued for six hour-long sessions, and during these interviews the patient developed a relationship with the "therapist" behind the screen (only a technician was present adjusting the machine). During this period she had changed so dramatically that she became an efficient secretary and found a position of considerable responsibility. Regular weekly sessions with her former therapist were continuing throughout this period, but Mascio and Brooks comment that the heuristic value of this study for the delineation of the factors necessary and essential for therapeutic movement and progress to occur is not diminished.

[1] *Arch. gen. Psychiat.*, 1961, 4: 513-516 (May).

AGE SHALL NOT WEARY THEM.

IN the account of the annual meeting of the Queensland Branch of the British Medical Association published in the issue of December 2, 1961, the following paragraph appears (page 924):

> *Councillors Elected in 1690 for Two Years:* Dr. J. R. Adam, Dr. R. A. McCullagh, Dr. R. Miller, Dr. K. S. Mowatt, Dr. R. F. OShea, Dr. H. S. Patterson, Dr. S. A. McDonnell.

All these gentlemen, so far as we know, are hale and hearty and still serving on the Branch Council. So we are not sure whether we should congratulate them on their longevity and tenacity in office or apologize to the Queensland Branch for a typographical error. To solve the dilemma we gladly do both.

SHORTER ABSTRACTS.

PHYSICAL MEDICINE.

MINERAL METABOLISM FOLLOWING POLIOMYELITIS. F. Plum, *Arch. phys. Med.*, 1961, 42: 348-362 (May).

THE author has carried out controlled calcium and phosphorus balance studies on over 50 poliomyelitis patients, the degree and location of whose paralysis varied widely. During early convalescence, the intensity of hypercalciuria was nearly as great in mildly paralysed patients as in severely paralysed and immobilized patients. However, the duration of hypercalciuria was directly related to the extent of paralysis; increased urinary calcium excretion persisted in paraplegics for over six months, and in many quadriplegics for over a year. Active and passive physical therapy, passive standing (tilt table) and early ambulation on crutches were evaluated for their effect on hypercalciuria. Physical therapy had no detectable effect on hypercalciuria, and forced early ambulation was, at best, of equivocal metabolic value. In reversing the mineral loss, the muscular capacity for mobilization was apparently more important than was actual mobilization. The metabolic effects of the hormone "Nilevar" were studied in nine cases. Calcium excretion dropped to normal levels within three weeks, but a rebound of hypercalciuria followed withdrawal of the drug, so that the net mineral loss was little changed by the treatment. Special attention was paid to preventing urinary calculi. Calcium intake was limited to 500 to 700 mg. per day. Adoption of the prone position prevented genito-urinary stasis of crystalline material. The daily urine output was maintained at between 1500 and 2000 ml. When this programme was initiated promptly after the illness, only 5·5% of respirator patients developed urinary stones. When the programme was delayed for two months to three years, 26·5% of respirator patients developed lithiasis.

EFFECT OF SHORT WAVE DIATHERMY ON RADIO-SODIUM CLEARANCE FROM THE KNEE JOINT IN THE NORMAL AND IN RHEUMATOID ARTHRITIS. R. Harris, *Arch. phys. Med.*, 1961, 42: 241-249 (April).

THE author has used the radio-sodium clearance technique of Kety to compare the effect of short-wave diathermy on circulation in normal knees and in rheumatoid knees. In normal knees the increase in circulation averages 100%. In quiescent rheumatoid knees there is a major increase, averaging 60%. In active rheumatoid diseases major increases were not found, and in four of five subjects there was a decrease in the circulation. This decrease is of the same order as that found with the intraarticular injection of cortisone, and thus shows that there is some basis for using heat in treating active rheumatoid joints.

ACUTE SOFT TISSUE, CALCINOSIS. S. G. Feuer and O. Fliegel, *Arch. phys. Med.*, 42: 492 (July).

THE authors state that acute deposit of calcium salt in soft tissues is a morbid entity often mistaken for acute cellulitis, gout or the like. It has been observed in various areas of the upper and lower extremities. The natural history of the disease, as well as its clinical and X-ray appearances, is discussed, and a series of nine cases is presented. The authors classify the condition, termed acute soft-tissue calcinosis, as belonging within the group of extraskeletal calcinosis, the chronic forms of which have been described as calcinosis interstitialis, calcinosis circumscripta and tumerous calcinosis respectively. Calcareous gout or *Kalkgicht*, a term originated many years ago by German authors who believed that a particular diathesis comparable with genuine gout made the patient liable to these conditions, has been abandoned because of lack of evidence of distinct laboratory features. The authors show that the condition is self-limiting, and discuss the treatment on this basis. They point out that the differential diagnosis between this condition and calcified tendinitis and bursitis is extremely important to the physiatrist, because of the wide variation in type of treatment. The latter conditions call for a dynamic programme of physical therapy, whereas the former responds adequately to physiological rest. However, this should not be allowed to be too prolonged, because of the danger of such complications as "frozen shoulder". Apprehensive patients may need physical therapy to prevent loss of function and residual deformities.

ISOMETRIC EXERCISES IN THE PARAPLEGIC AND IN THE PATIENT WITH WEAKNESS OF QUADRICEPS AND HAMSTRINGS. J. W. Gersten, *Arch. phys. Med.*, 1961, 42: 498 (July).

THE author states that earlier studies have shown that isometric exercises are effective in increasing muscle strength and endurance. Tension development, and not anoxia, was responsible for the improvement in strength. He now reports the results of experiments in which the primary aim was to study the effect of isometric and isotonic exercises on muscle function in the upper and lower extremities. The triceps in paraplegic patients and the quadriceps and hamstrings in patients with disability of hip or knee were treated with isotonic (progressive resistance) exercises or with isometric exercises. Isometric tension and 10 repetition maximum were recorded at weekly intervals. Improvement in muscle strength was essentially the same after both types of exercises. In the few instances in which significant differences existed, they were always in favour of isometric exercises. Increase in 10 repetition maximum was always significantly greater than increase in isometric tension. The magnitude of the increase in function of hamstrings and quadriceps was much greater than the increase in triceps function. Several factors, including electrical activity in the contracting triceps, were examined in order to throw some light on this difference between upper and lower extremity muscles studied, but no satisfactory explanation was forthcoming.

PRESSURE-VOLUME RELATIONSHIPS IN EMPHYSEMA PATIENTS BEFORE AND AFTER BREATHING EXERCISES. H. McKinley *et alii*, *Arch. phys. Med.*, 1961, 42: 513 (July).

THE authors have measured intraœsophageal pressures and respiratory volume in six patients with pulmonary emphysema before and after one month of breathing exercises. Measurements were made of total work, elastic work, non-elastic work and active expiratory work per litre. Symptomatic improvement, in terms of decrease in dyspnœa, was reported by five patients. Decreases in all phases of work, except elastic work, were produced by "Isuprel", although only the decrease in active expiratory work was statistically significant. Although there were no statistically significant changes in work after one month of breathing exercises, there was a strong tendency towards an increase in all work except elastic work.

A STUDY OF PERIPHERAL NERVE INVOLVEMENT IN FIFTY-FOUR PATIENTS WITH MULTIPLE SCLEROSIS. O. Miglietta and M. Lowenthal, *Arch. phys. Med.*, 42: 573 (August).

THE authors state that involvement of peripheral nerves is nuot a prominent feature of multiple sclerosis, at least in the chronic stage, and does not represent a problem in rehabilitation. Out of 54 patients examined, three were found to have one or more peripheral nerves involved, and in two of these the lesion was celearly due to compression. This observation points to the need for careful consideration and attention to be devoted to the positioning of the patient in bed, wheelchair or Stryker frame, to avoid further damage to an already fragile and compromised organism.

COMPENSATION FOR CONTRACTURE DEFORMITY IN AN IMPROVED SOCKET DESIGN FOR ABOVE-KNEE PROSTHESES. M. H. Anderson *et alii*, *Arch. phys. Med.*, 1961, 42:485 (July).

THE authors state that between March, 1956, and June, 1958, a total of 201 quadrilateral suction socket prostheses were fitted as part of the teaching activities of the Prosthetics Education Program of the University of California Medical School at Los Angeles. Accurate records were kept of stump perimeters, socket inside perimeters, flexion and abduction contracture angles, and stump condition. These records were analysed in June, 1958, and three problems appeared to be serious enough in approximately 50% of the cases to warant further study. These problems were œdema in the distal portion of the stump, wide-base gait and excessive anterior pelvic rotation. Various methods and instruments were developed (i) for making accurate

measurements of the amount of flexion contracture that would have to be compensated for in prosthetic socket design if anterior pelvic rotation was to be held to 10° or less, (ii) for making accurate measurements of abduction contracture and (iii) for designing the socket to compensate for such contractures, to hold the gait base to not more than two inches. Methods were developed for shaping the socket with shoulders inside to give support to the end portion of the stump. Sixty prostheses have been fitted by these techniques between September, 1959, and June, 1960. Follow-up observation and examination indicate that œdema has been greatly reduced and in most cases eliminated, and that stump condition has been improved. Anterior pelvic rotation is held to a maximum of 10° and gait base to a maximum of two inches.

NEUROLOGY.

EVALUATION OF UML-491 IN THE TREATMENT OF VASCULAR HEADACHES. A. P. Friedman and S. Losin, *Arch. Neurol.*, 1961, 4: 241-245 (March).

THE authors investigated the use of "UML-491" (methysergide) in 150 migraine patients. Of these, 127 showed some improvement while receiving the drug. Marked improvement was recorded in 65% of the patients diagnosed as having migraine, and also there was pronounced reduction in frequency and severity of attacks. Methysergide, which is a lysergic acid derivative antagonistic to serontin, was well tolerated. The authors conclude that further controlled clinical and pharmacological studies are necessary for a final evaluation of this drug.

CLINICAL ASPECTS OF STEREOTACTIC THALAMOTOMY IN THE HUMAN. V. H. Mark *et alii, Arch. Neurol.* 1960, 3: 351-367 (October).

THE authors discuss the treatment of chronic severe pain by means of stereotactic thalamotomy. They performed 19 thalamotomies on patients with chronic severe pain using stereotactic technique. Thirteen of the patients had primary head and neck pain and had some relief of their pain following thalamotomy. The destruction of thalamic structures other than the sensory relay nuclei was suggested as a possible cause of pain relief, since some of these patients had minimal sensory loss, yet complete relief of pain. The procedure is especially applicable to patients with cancer of the head and neck and chronic severe pain, since the duration of pain relief afforded by the procedure falls into the life-expectancy range of these patients.

ANÆMIA AND INTERMITTENT FOCAL CEREBRAL ARTERIAL INSUFFICIENCY. R. G. Siekert *et alii, Arch. Neurol.*, 1960, 3: 386-390 (October).

THE authors discuss five patients who had intermittent cerebral arterial insufficiency during a period of anæmia which was severe enough to raise a question of a relationship between the transient attacks of ischæmia and the anæmia. They hold that while no experimental proof is available, these clinical experiences suggest that a direct relationship exists. The symptoms were focal in nature, rather than generalized. The hæmoglobin level was between 30% and 50% (Haldane scale).

CRANIOPHARYNGIOMA IN THE ELDERLY. R. W. Ross Russell and J. B. Pennybacker, *J. Neurol. Neurosurg. Psychiat.*, 1961, 1: 1-13 (February).

THE authors describe the clinical features of 24 middle-aged and elderly patients suffering from craniopharyngioma. They point out that in children there are two main syndromes, visual failure from compression of the optic nerve and chiasma, and symptoms and signs resulting from obstruction of the third ventricle (headache, papilloedema and separation of the sutures). Hypothalamic and pituitary damage as evidenced by endocrine or growth abnormality is common, and calcification can often be seen in the X-ray film. However, in adults there is much less tendency for the tumour to obstruct the flow of cerebro-spinal fluid, and the incidence of endocrine abnormality falls sharply. Visual failure from chiasmal compression remains common and mental disturbance becomes of increasing importance. In the great majority of patients in the series observed the visual defect was bitemporal. In patients examined early, the bitemporal field defect could be of a depressional or scotomatous variety, the scotomas often being paracentral and terminating sharply at the vertical meridian. The mental disturbance varied; in half the cases no defect could be found. In four there was moderate deterioration of recent memory, with somnolence, apathy and loss of interest. Eight patients presented the picture of advanced organic dementia.

HYDROCEPHALUS IN ADULT FOLLOWING SPONTANEOUS SUBARACHNOID HÆMORRHAGE. R. F. Kibler *et alii, Brain*, 1961, 84: 45-61 (March).

THE authors discuss five cases of hydrocephalus following spontaneous subarachnoid hæmorrhage. The cases were due to proven or suspected congenital aneurysm on or near the circle of Willis. The block to the flow of cerebrospinal fluid, when demonstrated by air studies, was in the upper basal cisterns. The absence of filling of the cortical subarachnoid spaces during such studies is considered a reliable radiological sign of a block at this area, provided a determined effort is made to fill these cortical channels. Temporary or permanent shunting of cerebrospinal fluid may bring about remarkable recovery. Drainage should be continued for two or more weeks in suspected cases before being considered ineffective. It is unlikely that this complication of subarachnoid hæmorrhage will be prevented by repeated lumbar punctures during the acute phase of subarachnoid bleeding.

PSYCHIATRY.

SIMULATION OF A PREVIOUS PSYCHOTIC STATE. L. Sadow and A. Suslick, *Arch. gen. Psychiat.*, 1961, 4: 452 (May).

THE authors' premise is that a patient who has had a previous psychotic episode with ego disintegration and regression may, under subsequent stress, resort, as a defence, to the simulation of some of his own experiences of the earlier psychotic state. They point out that this has been recognized through the ages (for example, Ulysses and David), and comment that this may be more widespread than is at present realized, so explaining the relatively good results achieved in certain patients who repeatedly become psychotic. They briefly outline five examples in which the symptoms were used with varying degrees of concious awareness, ranging from the planned and deliberate use of synthetic psychosis for the avoidance of a dangerously overstimulating situation to the completely unconscious use of simulation as a defence. Therapeutic intervention consisted in helping the patient use more economic defences, and in more or less directly interpreting to the patients that they were stimulating. The described clinical picture represents a defensive ego structure, and suggests an intact and integrating rather than a deteriorating ego.

SEQUELÆ OF PREMATURITY: PSYCHOLOGICAL TEST FINDINGS. M. S. Rabinovitch *et alii, Canad. med. Ass. J.*, 1961, 84: 822 (April).

THE authors took a random sample of 50 premature and 50 full-time infants, half of each group being seven years old and half eleven years old at the time of the investigation. All were in good physical health, and all of at least average intelligence. The two age groups were selected to obtain a glimpse of any longitudinal picture, and each child was given a series of physical and psychological examinations and tests. Each child and his parents were interviewed by a psychiatrist, and every home was visited several times by a social worker. On the full Wechsler Intelligence Scale for Children, the controls had an average I.Q. of 116, while those born prematurely had an I.Q. of 108, a statistically significant difference. Further analysis showed a greater discrepancy between the older groups than the younger groups. In test situation which required physical coordination and integration of perceptual and motor skills, it was found again that the control subjects were superior to the prematures. Also, a very strong trend was found for the controls to have accomplished earlier the mastery of developmental tasks (for example, the mean age of walking was 16·2 months for the controls). The authors conclude that these data support the trend towards an "ego" psychology approach to the understanding and treatment of behaviour deviations in children.

Medical Societies.

THE AUSTRALIAN CANCER SOCIETY.

THE inaugural meeting of the Australian Cancer Society was held in Canberra on October 19, 1961. The following State representatives attended:

New South Wales: Dr. H. Selle and Dr. A. B. Lilley.

Queensland: Dr. A. G. S. Cooper.

South Australia: Dr. B. S. Hanson and Sir Edward Morgan.

Tasmania: Dr. C. Craig.

Victoria: Cr. W. J. Kilpatrick (in the chair), Mr. W. A. Dick and Dr. W. P. Holman.

Western Australia: Mr. Schweizer and Professor R. E. J. ten Seldam.

Also present were Mr. A. J. Buchan of South Australia and Dr. E. V. Keogh of Victoria. Professor F. C. Courtice attended as observer for the Australian Commonwealth Territory. Miss Ruth Hair of Victoria acted as secretary of the meeting.

Apologies for non-attendance were received from the Hon. R. R. Downing, M.L.C., and Sir Edward Hallstrom from New South Wales; from Dr. A. Fryberg from Queensland; and from Mr. A. T. Abbott of Tasmania. It had not been possible to arrange for representatives from the Northern Territory or from the Territory of Papua and New Guinea.

The meeting was officially opened by a speech from Dr. D. A. Cameron, Commonwealth Minister for Health.

ADOPTION OF CONSTITUTION.

A draft constitution was submitted to the meeting. This was submitted to critical scrutiny, and was adopted subject to a series of minor amendments. Sir Edward Morgan, whose guidance on points of drafting had been invaluable throughout, agreed to incorporate these amendments in the final draft of the constitution for circulation to members. It was agreed that the Australian Cancer Society be formed forthwith, with the rules and constitution as approved. It was thereupon necessary to make a number of decisions to implement the constitution as adopted. These included the following matters.

Fund Raising.

It was agreed that the Society's present policy concerning fund raising be stated as follows: (*a*) It is not the intention of the Society to conduct a public appeal on its own behalf. (*b*) The Society will give all possible assistance to members who wish to raise funds in their own States or Territories. (*c*) The Society will seek funds from members by way of annual subscription, based on estimates of expenditure prepared from time to time.

Meetings.

It was agreed that an annual meeting should be held in the month of October each year. It was further agreed that the intention of the Council should be to hold at least two meetings each year for the first three years, such meetings to be held in each State in rotation.

Appointment of Patron.

Members discussed the appointment of a Patron, and it was agreed that, at the appropriate time, an approach be made to the Governor-General (Viscount De L'Isle, V.C.).

Appointment of Trustees.

In terms of Section 12 of the Constitution, the following persons were appointed Trustees of the Australian Cancer Society: Sir Edward Hallstrom of New South Wales, Mr. C. R. Darvall of Victoria, and Sir Edward Morgan of South Australia.

Appointment of President and Vice-President.

Councillor W. J. Kilpatrick was elected first President of the Australian Cancer Society, with Dr. B. S. Hanson as Vice-President.

Appointment of Officers and Servants.

Members agreed that the headquarters of the Society should be in a capital city with major teaching hospitals. For this reason it was decided that the Secretariat should not be located in Canberra. After discussion it was agreed: (i) that the headquarters of the Society be at Melbourne for the time being; (ii) that a part-time Medical Director be appointed; (iii) that a secretary be appointed after a Medical Director had been chosen, as it would be appropriate for both appointees to be in the one State; (iv) that the Anti-Cancer Council of Victoria be asked to provide secretarial services to the Australian Cancer Society in the meantime.

Appointment of Third Member of Executive Committee.

It was agreed that the Hon. R. R. Downing, M.L.C., be asked to accept appointment to the Executive Committee with the President and Vice-President.

Appointment of Committees.

After discussion members agreed: (i) that all members of the Council of the Society should be asked to serve on at least one of the four committees; (ii) that professional education on cancer be regarded as a function of the Medical and Scientific Committee and that the Committee appointed for "Education on Cancer" be advised accordingly; (iii) that the following members of the Council be appointed Chairmen of Committees: (*a*) Medical and Scientific—Dr. B. S. Hanson; (*b*) Education on Cancer—Mr. W. A. Dick; (*c*) Service to Cancer Patients—Cr. W. J. Kilpatrick; (*d*) Finance—Mr. R. Forsaith; (iv) that the Executive Committee be authorised to deal with financial matters until a Finance Committee is appointed; (v) that all medical persons present attend a meeting later in the day to consider the functions of the Medical and Scientific Committee; (vi) that Dr. A. B. Lilley and Dr. E. V. Keogh be appointed members of the Medical and Scientific Committee.

INTERNATIONAL UNION AGAINST CANCER.

Application for Membership.

Membership of the International Union Against Cancer was discussed, and it was agreed that, although some States already enjoyed individual membership, an application should be made on behalf of the Australian Cancer Society.

World Congress, Moscow, 1962.

It was agreed to grant formal accreditation to a delegation from Australia to attend the International Cancer Congress to be held at Moscow in July, 1962. Representatives from Victoria advised that the Anti-Cancer Council of Victoria wished to nominate the following members: Dr. J. H. Colebatch, Dr. W. P. Holman, Dr. E. V. Keogh, Cr. W. J. Kilpatrick, Dr. D. Metcalf. New South Wales representatives reported that Dr. A. B. Lilley would attend as official representative of the State Cancer Council and that in addition a number of doctors from that State would be attending.

World Congress, 1970.

It was noted that the World Cancer Congress would be held in Japan in 1966, and the suggestion that Australia should seek appointment as the host country for 1970 was discussed. The International Union Against Cancer usually held an interim meeting in the country chosen for the World Congress, such meeting being held two years before the Congress. The Chairman advised that he would be attending the Finance Meeting of the International Union Against Cancer at Geneva in January, and was authorized to explore the possibility of applying for the 1970 World Congress to be held in Australia.

Congresses.

SOCIETY FOR SOCIAL MEDICINE.

THE fifth annual meeting of the Society for Social Medicine was held in London on September 28 to 30, 1961, and was attended by about 110 academic workers from all parts of the United Kingdom, together with a few visitors from overseas.

Social Medicine in Britain.

No one attempted to define social medicine, but all agreed that it included epidemiology, medical sociology and preventive medicine. Methods of teaching these subjects were debated in the opening session, an informal discussion on

training and careers in social medicine, and the following points were made.

Epidemiology is the basic science of social medicine, and epidemiological studies are making important contributions to medical knowledge. Biostatistics should be taught to preclinical medical students, who should then be given the opportunity to use statistical techniques, perhaps in some original work of their own during the undergraduate medical course. More students should be encouraged to take the B.Sc. (Med.) in this way. Elementary sociology, which should include some social psychology, is also suitable for inclusion in the preclinical part of the medical course.

The diversity of interests and backgrounds of academic workers in social medicine is at once a strength and a weakness of the academic departments. Their eclectic approach cuts across compartments, and so is a unifying influence; but there are inherent difficulties in a necessarily superficial acquaintance with work in a rapidly advancing science such as biochemistry. Interdepartmental conferences, particularly clinical case conferences and clinico-pathological conferences, help to overcome this disadvantage.

Postgraduate training can best be taken in service; and there is scope for recruitment to academic social medicine from many sources, of which general practice is likely to become more important in the future, because of the development of research in general practice, and because social medicine is the academic discipline most logically related to general practice.

An increasing problem is recruitment of non-medical workers; it is difficult to attract statisticians and social scientists, because there is no "room at the top" (that is, no chairs) for them; nor, in most cases, are they offered adequate salaries. This problem is likely to arise in Australia, as academic departments develop.

The General Practitioner and Preventive Medicine.

Opening the discussion on the general practitioner and preventive medicine, Professor E. M. Backett (Aberdeen) said that an increasing part of the work of the general practitioner was the management of chronic disease, often symptomless until late in its course, and therefore not detected in time for treatment to be of much value. Simple screening techniques, which could be combined with the existing work of the general practitioner, made earlier, presymptomatic detection of many of these chronic diseases feasible. There was also a need for programmes of community health education, to enhance public awareness of the urgency of presymptomatic screening. Medical students, too, should be taught more about the special hazards of certain groups, such as middle-aged multiparæ, vulnerable to cancer of the cervix, a readily detected disease. Part of the training of the general practitioner should be in the use of new methods of detection of disease.

Other speakers in this session discussed the preventive work of the general practitioner in the fields of maternal and child health (with reference to the conflicting conscious and real needs of mothers), mental health (common psychiatric disorders in general practice, family dynamics and the family doctor), and occupational health (fitting the man to the job, and keeping the wheels of industry turning).

Other Sections.

Several papers were given in each of the sections on natality, physique and non-infectious disease, geographical epidemiology, and industrial medicine. Many of these (which will mostly be published in *The British Journal of Preventive and Social Medicine*) were preoccupied with problems of methodology, as were most speakers in the discussions afterwards. Precision in epidemiology is hampered by lack of agreement among clinicians about diagnostic criteria, by the problem of observer error, and by the limitations of statistical methods in sampling of populations. Even apparently "pure" vital statistics based on death certification suffer from the limitations imposed by the unreliability of certificates and the caprices of coding rules.

Mental and Behavioural Disorders.

R. W. Parnell (Oxford) gave the results of studies to relate somatometric and psychometric findings to diagnostic grouping, age of admission, length of stay, and response to treatment of mental hospital patients. There is some evidence that such measurements can be used to help predict which patients will be most likely to respond to given methods of treatment, though controlled trials, which would clarify this further, cannot be made, as this would be unethical in the circumstances.

J. Tizard and N. Goodman (Maudsley Hospital, London) gave an account of their studies of the prevalence of mental deficiency. Because of better antenatal and postnatal care, more mongoloid children survive nowadays, and the prevalence of mongolism has increased since the last large survey was made by Lewis 30 years ago. Contrary to expectations, all other forms of mental deficiency have fallen by about 30% in the last generation. Some, due to birth injury, can be accounted for, but other explanations for the change are being sought.

M. Power (Social Medicine Research Unit, London) described pilot studies of juvenile delinquency in East London. There are two distinct groups of delinquents: stealing is commonest among small boys, operating frequently in gangs, and this form of delinquency reaches its peak at 14 years; but at about the age of puberty, crimes of violence and other antisocial acts begin to appear, usually committee by solitary individuals rather than by gangs, seldom by recidivists of the first group. Social studies are proceeding, to elucidate the environmental factors which may influence delinquents in this second, more serious, category, which is increasing in frequency, and is becoming an important social problem.

This was a most stimulating meeting. Australian visitors would be welcome at future annual meetings of this society.

Correspondence.

HOW SILLY CAN YOU BE?

SIR: A few days ago, the mother of a bad eczema baby rang me and said: "Doctor, the baby is no better with the treatment; he's still itching badly and crying like mad. Is there anything else you can suggest?"

"Yes", I said, "just put him in a bath of nice weak warm Condy's and he will probably drop off to sleep on your arm."

"But Doctor, my husband has got him in a bath of nice weak warm Condy's, and he's bawling his head off worse than ever; what do we do now?"

Without pausing to think, I said, "Take him out."

Yours, etc.,

170 St. George's Terrace, Perth.
J. M. O'DONNELL.

December 1, 1961.

MEDICAL SCHOOL OF THE UNIVERSITY OF NEW SOUTH WALES: THE CURRICULUM.

SIR: A report recently published in *The Sydney Morning Herald* (November 8, 1961) might create doubt as to the general acceptability of the undergraduate curriculum of this University's new medical school. Dr. W. Freeborn, with whose name the report was associated, informs me that his remarks related not to the medical course actually being planned by the Faculty of the University, but to curricular proposals made by an advisory medical committee of the N.S.W. State Government. This committee, of which Dr. Freeborn was a member, submitted its report in 1958.

In any case, *The Sydney Morning Herald's* criticism is unfounded. Whereas the advisory medical committee recommended a five-year medical course leading to the M.B. degree, the University has firmly decided against this recommendation; instead it will offer the usual six-year undergraduate course. A cogent reason for this decision is the desire that our graduates should enjoy full reciprocity with other States in Australia and with British countries overseas.

The medical course of this University will in fact accord fully with the recommendations of the General Medical Council. Last year, the proposed design and content of the curriculum were discussed with Sir David Campbell, President of the Council, to ensure that they conformed with standard requirements. The course will lead to the double qualification, M.B., B.S.

The responsibility and opportunity in planning the new curriculum are to adopt well-proven features of other courses, to trim "dead wood", and to allocate time to subjects of new and growing importance in modern medicine. This is all clearly appreciated by the Faculty. Relatively

more time will be devoted to physiology, biochemistry, and the functional aspects of anatomy, than has been traditional in medical undergraduate courses in Australia, and the teaching of these subjects will be carried on into the clinical years. This shift of emphasis is in full accord with recent curricular developments in the United Kingdom and the United States.

In consequence of these aims, the course will consist of: (i) one year of premedical studies (physics I, chemistry I, mathematics I, and general biology); (ii) one and two thirds years preclinical studies (anatomy, physiology, biochemistry and medical statistics); (iii) three and one third years paraclinical and clinical subjects (medicine, surgery, human genetics, pathology, microbiology, pharmacology, obstetrics and gynæcology, pædiatrics, psychiatry, social and preventive medicine, etc.). In each year beyond the first, there will be instruction in the humanities and social sciences.

Throughout the course there will be emphasis on integration of teaching, both between the various preclinical subjects and between the preclinical and the clinical subjects. Great stress will be placed on tutorial teaching with student participation, both in the laboratories and at the bedside. The student will be trained in sound methods of learning, for example in how to make, record and analyse observations, how to use a medical library, and how to summarize and present subject matter.

Yours, etc.,

F. F. RUNDLE,
Dean of Medicine.

University of New South Wales,
Kensington.
December 4, 1961.

THE INFLUENCE OF MODERN FOOTWEAR ON FOOT DISABILITIES.

SIR: It has always disturbed me that the interest shown by our profession in the feet rarely extends beyond scratching the sole to elicit the plantar reflex. In consequence I was delighted to read Dr. Naomi Wing's well formulated paper on "The Influence of Modern Footwear on Foot Disabilities" (MED. J. AUST., November 18, 1961), and the warning it sounded. I regret to report, however, that since her paper was presented, the Italian influence has crept into the manufacture of school shoes.

Whilst on the subject of feet and footwear, I would like to describe a useful "gadget". It is an inclined plane foot rest with an angle of 30° to 35° for the use of typists and other office workers. It is simply made of wood and covered with a piece of carpet. The advantageous effects of this are obvious.

Yours, etc.,

ADRIAN PAUL.

R.P.A. Medical Centre,
100 Carillon Avenue,
Newtown,
New South Wales.
November 24, 1961.

THE FAILURE OF STAINLESS STEEL IN THE TREATMENT OF FRACTURES.

SIR: With reference to the recent article by E. Allcock (MED. J. AUST., November 11, 1961), two individual cases of failure of stainless steel implants have been reported. In our opinion several matters are obscure.

The pits shown in the Küntscher nail would not normally be present in a wrought product such as this, but could have been caused by corrosive action in the body—for example, due to two phase regions in the metal, or indentation damage occurring during surgery.

Examination prior to surgery could detect defective implants and care during surgery could prevent excessive damage. However, in our opinion there is no known metal which will consistently withstand the biomechanical stresses of weightbearing on a fracture which has not fully united even in the absence of defects. Sooner or later failure occurs, and the presence of a pit would only hasten failure by setting up stress concentrations at this point. In neither case described is there orthopædic certainty that the fracture had consolidated fully. In one case weightbearing took place at 10 days.

In the second case, accepting that failure has been metallurgical in that a corrosion cell has been formed, no evidence is offered or apparent as to the cause of this. However, it would be interesting to know the analysis of this steel and the physical properties as determined by metallographic examination. A quick check on the condition of stainless steel can be made before surgery by using a small magnet. All stainless implants should be non-magnetic if they are to be suitably resistant to corrosion in the body.

We agree with many statements made on page 802. However, terms such as fatigue hardening are confusing. We would advise that this unit for some time has been systematically investigating implants, both in the laboratory, the experimental animal and in a study of implants removed from "human failures".

Yours, etc.,

B. BLOCH,
Sydney Hospital.

G. WALLWORK,
School of Metallurgy, University of New South Wales.

Sydney.
November 27, 1961.

THE COAST HOSPITAL, SYDNEY: ASSOCIATION OF FORMER MEDICAL OFFICERS.

SIR: At a meeting chaired by Dr. Angus Murray at the University Club on November 16, 1961, it was decided to form an association of ex-medical officers of the Coast Hospital, later the Prince Henry Hospital, to be known as the Coast Association.

As the records of medical officers who have worked at the hospital are incomplete and we are anxious to make the Association as representative as possible, it is requested that all past medical officers forward their name and address to the secretary of the steering committee, Dr. C. R. Boughton, care of the Prince Henry Hospital. It is hoped to call a meeting as soon as possible of those who are interested to launch this Association.

Yours, etc.,

E. B. JONES,
Chairman.

The Prince Henry Hospital,
Little Bay,
Sydney.
December 1, 1961.

CONGENITAL ABNORMALITIES AND THALIDOMIDE.

SIR: Congenital abnormalities are present in approximately 1·5% of babies.

In recent months I have observed the incidence of multiple severe abnormalities in babies delivered of women who were given the drug thalidomide during pregnancy as an anti-emetic or as a sedative to be almost 20%. These abnormalities are present in structures developed from mesenchyme—that is, the bones and musculature of the gut. Bony development appears to be affected in a most striking manner, resulting in polydactyly, syndactyly and failure of development of long bones—namely, abnormally short femora and radii.

Have any of your readers seen similar abnormalities in babies delivered of women who have taken this drug during pregnancy?

Yours, etc.,

W. G. McBRIDE.

600 Railway Parade,
Hurstville,
New South Wales.
December 4, 1961.

THE LABELLING OF POISONS.

SIR: Many of the new insecticides, detergents and polishes on the market are labelled: "Caution. Seek medical advice if swallowed." When a mother telephones the family doctor and says her child has consumed a little of one of these substances, the general practitioner is in a quandary. As a rule, the least he advises is that someone should make the child vomit; but many doctors always play for safety by ordering the patient to hospital. There, it is easy for the casualty officer to tell sister to carry out gastric lavage;

but however skilfully that is done, it inevitably harms the psyche of the child, if not the œsophagus or stomach.

In most cases, there is really no need for any treatment, but it is practically impossible to find out about the particular poison. The present system involves a lot of suffering and worry, so I suggest that every poison should be labelled with information on quantity likely to do harm (say, to a 30 lb. child), chief toxic effects, whether emesis is contra-indicated, and best readily available antidote. If the authorities thought fit, such information could be given in code form, understandable by doctors.

Yours, etc.,

316 Highbury Road,
Burwood, E.13,
Victoria.
December 2, 1961.

ARNOLD GEORGE.

Notes and News.

Rockefeller Foundation Grant to Dr. P. L. T. Ilbery.

The Rockefeller Foundation has awarded Dr. P. L. T. Ilbery, of Sydney, a grant of £1405 10s. for round-trip travel between England and Australia to enable him, accompanied by his family, to study in the Meyerstein Institute of Radiotherapy, Middlesex Hospital, London.

Tenth International Congress of the History of Science.

The Tenth International Congress of the History of Science will be held at Cornell University, Ithaca, New York, from August 26 to 31, 1962, and at the American Philosophical Society, Philadelphia, Pennsylvania, from August 31 to September 2, 1962. Communications on the following subjects are invited, and will be assigned to the appropriate sections: (i) general problems in the history of science; methods, philosophy and historiography of science; (ii) history of technology and applied science; (iii) science in antiquity; (iv) science in the Middle Ages and the Renaissance; (v) mathematics and the exact sciences after 1600: (*a*) history of mathematics; (*b*) history of physics and astronomy; (*c*) history of chemistry, including pharmacy; (vi) biological and earth sciences after 1600: (*a*) natural history and biology (including medical biology); (*b*) geography, exploration, geology and oceanography; (vii) sciences of man (psychology, anthropology, sociology, linguistics). Applications to read papers must reach the Secretary no later than May 1, 1962. Further information may be obtained by writing to the Secretary, Tenth International Congress of the History of Science, Cornell University, Ithaca, New York, U.S.A.

Anti-Poliomyelitis Campaign in U.S.S.R.

According to a World Health Organization report, 77,478,000 Soviet citizens, aged from two months ot 20 years, were vaccinated against poliomyelitis in 1960. Live poliovirus vaccine prepared from Sabin strains incorporated in bon-bons was used for approximatelly 95% of these immunizations. This vaccine was also used for more than 13 million people in Albania, Bulgaria, Hungary, People's Republic of Viet-Nam, German Democratic Republic, mainland China, North Korea and Czechoslovakia.

Developments in Plastics.

A new plastic, polypropylene, discovered after almost a quarter-century of research, was recently shown in Sydney at an ICIANZ exhibition. Plants in Britain, the U.S.A., Germany and Italy are already producing it in quantity. Its list of properties is impressive, and many are of interest to manufacturing industries. It is an ideal material for manufacturers of joints and fittings for underground service pipes, and for corrosion-resistant chemical plant. It will also be used for piping for insulating wires and cables, and for components of radio and TV sets.

Polypropylene is lighter than anything in the plastic world, easily moulded, tough, rigid and yet flexible, and able to stand up to higher than usual temperatures and all sorts of chemicals. It comes from propylene, a gas which is always present wherever oil is cracked for petrochemicals. It is stiff enough when thick to replace metal and wood for some purposes, yet flexible and tough enough when thin to

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED DECEMBER 2, 1961.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	2(1)	1(1)	2(1)	1	..	..	..	..	6
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	2	..	2
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	10	15(12)	2(1)	..	..	..	1	..	28
Diphtheria	..	..	..	..	..	..	..	..	..
Dysentery (Bacillary)	..	..	..	2(2)	3(2)	..	..	..	5
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	5(3)	..	..	..	..	..	..	5
Infective Hepatitis	128(48)	76(33)	42(17)	30(14)	5(5)	3(1)	1	4	289
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	1(1)	1(1)	..	..	..	2	..	4
Leptospirosis	..	..	1	..	..	..	..	..	1
Malaria	..	..	1	..	..	..	..	..	1
Meningococcal Infection	2	1(1)	..	1	..	..	..	..	4
Ophthalmia	..	..	..	..	4	..	..	..	4
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	12(4)	..	8(3)	..	..	..	..	..	20
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	29(22)	3	2	5(5)	..	..	..	39
Salmonella Infection	..	..	..	1(1)	..	..	..	..	1
Scarlet Fever	6(5)	11(8)	2	2	4(4)	1	..	..	26
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	3	..	..	..	..	..	3
Trachoma	..	..	..	..	12(1)	..	..	..	12
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	58(45)	14(12)	2(1)	10(8)	3(3)	5(3)	1	1	94
Typhoid Fever	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

act as a hinge. It stands up to boiling water and could be used for hot water piping. It is sufficiently heat-resistant to be used in the manufacture of electric jugs. You can boil it, bend it, jump on it and soak it in acid with no result.

The first company in the Commonwealth making polypropylene is the Wilton plant of ICI Ltd. England, which is capable of producing 11,000 tons a year. In tests at Welwyn technical service laboratories of ICI's Plastics Group water was kept boiling non-stop for six months in a polypropylene jar. Polypropylene tubes, rods, sheets, films and filaments were stretched, squeezed, flexed, immersed in all types of corrosive liquids and subjected to every kind of indignity.

Polypropylene is the result of brilliant Continental research work, mainly that of Professor Natta of the Italian Montecatini combine. Its discovery brought reality to a quarter-century dream of chemists. This was to be able to form long chains of molecules from olefines other than ethylene and so invent a completely new plastic. All attempts either with catalysts or high pressure had resulted only in sticky messes, commercially useless. The polypropylene story began about 1954, when a German chemist, Professor Zarl Ziegler, discovered a new group of catalysts. One of them polymerized ethylene gas—that is, linked up ethylene molecules in long chains—to make polythene without the use of high pressures. Then in Italy, Professor Natta, experimenting with the Ziegler catalysts, discovered a method of polymerizing propylene with one of them. He produced quite a different substance which was a winner from the start.

The real importance of Natta's polypropylene was in its structure because the catalyst he was using, a combination of aluminium and titanium, made the propylene molecules act like well-drilled soldiers; they all linked up facing the same direction. Another chemical, isoprene, has been polymerized with the help of the same catalyst to form a rubber identical with natural rubber. Nature is adept at producing perfectly regular long chain molecules—as in rubber, hair and wool—by means of her own catalysts (enzymes). If a Ziegler catalyst can be used in place of an enzyme to produce "natural" rubber, then scientists may be on the threshold of some startling discoveries about the chemical properties of living cells. As a filament yarn polypropylene may outdo even nylon and "Terylene" in industrial uses because of its lower price and great strength, and its future in the manufacture of cordage is already assured. Scientists could hardly ask for a material of greater versatility, yet many claim that the story of polypropylene is just beginning.

The Prince of Wales Hospital, Randwick, New South Wales.

The Prince of Wales Hospital, Randwick, New South Wales, on November 1, 1961, severed its connexion with Sydney Hospital, to become a teaching hospital of the University of New South Wales. At that time a new board, under the chairmanship of Mr. J. C. Fletcher, took over control. Dr. R. F. Kaye-Webster has been appointed Medical Superintendent and Chief Executive Officer of the hospital.

First Asian and Australasian Congress of Anæsthesiology.

THE first Asian and Australasian Congress of Anæsthesiology will be held on November 6 to 11, 1962, at the Philippine General Hospital, Taft Avenue, Manila. Further particulars may be obtained from the Organizing Committee at the foregoing address.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Connolly, Michael Alfred Francis, M.B., B.S., 1958 (Univ. Sydney), 435 Marrickville Road, Dulwich Hill.

The undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Cotton, Robert Tilney, M.B., B.S., 1960 (Univ. Adelaide), 26 Kyre Avenue, Kingswood.

Carney, John Malcolm, M.B., B.S., qualified December, 1961, 24 George Street, Torrens Park.

Glinka, Natalie, M.B., B.S., qualified December, 1961, 24 George Street, Torrens Park.

The undermentioned has been elected as a member of the South Australian Branch of the British Medical Association:

Lines, David Robin, M.B., B.S., 1961 (Univ. Adelaide).

Deaths.

THE following deaths have been announced:

FISCHER.—George Alfred Fischer, on December 7, 1961, at College Park, South Australia.

BURDEN.—Frank Burden, on December 7, 1961, at Hove, South Australia.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): Medical Officers to Sydney City Council. All contract practice appointments in New South Wales. Members are requested to consult the Medical Secretary before undertaking practice in dwellings owned by the Housing Commission.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

Authors of papers are asked to state for inclusion in the title their principal qualifications as well as their relevant appointment and/or the unit, hospital or department from which the paper comes.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full data in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: 68-2651-2-3.)

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